

October 11, 2007

MEMORANDUM

UTAH DEPARTMENT OF TRANSPORTATION

TO: Jim McMinimee, P.E., Chairman

FROM: Barry Axelrod
Recorder, Standards Committee

SUBJECT: Standards Committee Meeting Minutes and Next Meeting

The next meeting has been scheduled for Thursday, October 25, 2007 at 8:00 a.m., in the main 1st floor conference room of the Rampton Complex.

Item	Remarks	Sponsor
1. Minutes of August 30, 2007	For approval	Barry Axelrod
2. Standard Specification 01355, Environmental Protection (Action log item #5)	For approval (doc pg 34)	Jerry Chaney
3. Standard Specification 01456, Materials Dispute Resolution	For approval (doc pg 46)	Tim Biel
4. Standard Specification 02735, Microsurfacing (Action log item #3)	For approval (doc pg 55)	John Butterfield Tim Biel
5. Standard Specification Hot Mix Asphalt related (See listing)	For approval (doc pg 71)	John Butterfield Tim Biel
6. Standard Specification 02752, Portland Cement Concrete Pavement	For approval (doc pg 118)	Bryan Lee Tim Biel
7. Standard Specification 02789, Slurry Seal (Action log item #4)	For approval (doc pg 138)	John Butterfield Tim Biel
8. Standard Drawing GW Series (GW 3 and GW 4) (See listing)	For approval (doc pg 151)	Wes Starkenburg
9. Standard Drawing SN 4, Flashing Stop Sign, Deletion	For approval (doc pg 161)	Wes Starkenburg
10. Standard Specification and SN Standard Drawing Series for Traffic Signs (See listing/seven submittals)	For approval (doc pg 168)	Glenn Schulte
11. Standard Drawing ST Series (ST 1 and ST 5) (See listing)	For approval (doc pg 240)	Wes Starkenburg
12. Standard Drawing SL 11, Single Transformer Substation Details	For approval (doc pg 252)	Richard Hibbard
13. Standard Drawing SL 18, Single Transformer Substation Details	For approval (doc pg 261)	Richard Hibbard
14. Standard Specification 16525, Highway Lighting	For approval (doc pg 268)	Richard Hibbard
15. Standard Drawing TC 5, Work Zone Business Access Signing	For approval (doc pg 299)	John Leonard
16. Standard Drawings DD Series (See listing)	For approval (doc pg 309)	Wes Starkenburg

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| 17. | Standard Drawings, Structure Concrete related | For approval
(doc pg 318) | Ray Cook |
| 18. | Standard Specification and Standard Drawings
Wildlife Crossed Related | For approval
(doc pg 333) | Paul West |
| 19. | Standard Specification 02936, Vegetation
Establishment Period (Deletion) | For approval
(doc pg 351) | Terry Johnson |
| 20. | Sub-Committee Update on other Standards
Approvals | For approval
(doc pg 356) | Robert Miles |
| 21. | Review of Assignment/Action Log | For review | Jim McMinimee |
| 22. | Meeting Improvements (on-going agenda item) | For discussion | Jim McMinimee |
| 23. | Other Business | For discussion | Jim McMinimee |
- JCM/ba
Attachments

cc:

Cory Pope Director, Region One	Stan Burns Engineering Services	Robert Miles Standards
Randy Park Director, Region Two	Boyd Wheeler Bridge Design	Barry Axelrod Standards
David Nazare Director, Region Three	Kris Peterson Construction	Patti Charles Standards
Dal Hawks Director, Region Four	Tim Biel Materials	Shana Lindsey Research
	Richard Clarke Maintenance	Tracy Conti Operations
	Robert Hull Traffic and Safety	Anthony Sarhan FHWA
	Michael Adams Traffic Management Division	Mont Wilson AGC
	Rex Harris Region 1, Preconstruction	Tyler Yorgason ACEC

Agenda Listing

Item 5: (For 2008)

02741 Hot Mix Asphalt
02969 Optional Use of RAP (Deletion)

Item 8: (For 2008)

GW 3 Concrete Curb and Gutter Details
GW 4 Concrete Driveways and Sidewalks

Item 10 (For 2008)

Submittal Sheet 1

SN 8 Ground Mounted Timber Sign Post (P1) (Delete)
SN 10 Ground Mounted Square Steel Sign Post (P3) (Delete)
SN 8A *Temporary Use Ground Mounted Timber Sign Post*
SN 8B Temporary Use Ground Mounted Square Steel Sign Post

Submittal Sheet 2

SN 9 Ground Mounted Tubular Steel Sign Post (P2) (Delete)
SN 9A Small Sign Tubular Steel Post Base (B1)
SN 9B Small Sign Tubular Steel Post Base (B2A)
SN 9C Small Sign Tubular Steel Post Base (B2B)

Submittal Sheet 3

SN 11 Slipbase Ground Mounted Tubular Steel Sign Post(P4) (Delete)
SN 10A Slipbase Sign Base (B3) Hardware
SN 10B Slipbase Sign Base (B3) Installation

Submittal Sheet 4

SN 11 Tubular Steel Sign Bases (B4A , B4B)
SN 12 Barrier Mounted Tubular Steel Sign Bases (B5A , B5B)

Submittal Sheet 5

SN 13A Tubular Steel Sign Mounting Requirements
SN 13B Tubular Steel Sign Mounting Hardware
SN 13C "Z" Bar Mounting Requirements

Submittal Sheet 6

SN 14A Freeway Sign Post Requirements
SN 14B Freeway Sign Post Requirements
SN 14C Freeway Sign Foundation & Fuse Plate Req.
SN 14D Freeway Sign Frame Installation Details
SN 14E Freeway Sign Bracket Details

Submittal Sheet 7

02891 Traffic Signs

Item 11: (For 2008)

ST 1 Object Markers "T" Intersection And Pavement Transition Guidance
St 5 Painted Median and Auxiliary Lane Details

Item 16: **(For 2008)**
DD 5A Entrance Ramps and Exit Ramps at Crossroads
DD 5B Entrance Ramps and Exit Ramps at Crossroads

Item 17: **(For 2008)**
07111 Dampproofing
09981 Concrete Coating

Item 18: **(For 2008)**
FG 4A Standard Wildlife Escape Ramp Details
FG 4B High Migratory Wildlife Escape Ramp Details

August 30, 2007

A regular meeting of the Standards Committee convened at 8:00 am, Thursday, August 30, 2007, in the 1st floor conference room of the Rampton Complex.

Members Present:

Jim McMinimee	Project Development	Chairman
Robert Miles	Standards and Specifications	Secretary
Barry Axelrod	Standards and Specifications	Recorder
Stan Burns	Engineering Services	Member
Randy Park	Region 2	Member
Shana Lindsey	Construction	Member
Lloyd Neely	Maintenance (for Richard Clarke)	Member
Robert Hull	Traffic and Safety	Member
Tim Biel	Materials	Member
Boyd Wheeler	Bridge Design	Member
Michael Adams	TOC	Member
Anthony Sarhan	FHWA	Advisory Member
Mont Wilson	AGC	Advisory Member
Tyler Yorgason	ACEC	Advisory Member

Members Absent:

Richard Clarke	Maintenance	Member
Rex Harris	Region 1, Preconstruction	Member

Staff:

Patti Charles	Standards and Specifications
Bob Nash	Bridge Design
Jerry Chaney	Environmental
Jason Richins	Bridge Design
Ray Cook	Bridge Design

Visitors:

Roland Stanger	FHWA
Todd Mac Gillvray	TransCore

Standards Committee Meeting

Minutes of the August 30, 2007 meeting:

1. Minutes of June 28, 2007 meeting were approved as written.

Motion: Boyd Wheeler made a motion to accept the minutes as written. Seconded by Robert Hull. Passed unanimously.

2. Standard Specification 02822, Right of Way Fence and Gate and Standard Drawings FG 1A, Right Of Way Fence And Gates (Wood Post); FG 1B, Right Of Way Fence And Gates (Wood Post); FG 2A, Right Of Way Fence And Gates (Metal Post); and FG 2B, Right Of Way Fence And Gates (Metal Post) (Agenda Item 2) - Presented by Paul West.

Barry commented that he had talked to Paul prior to the meeting about the applicability of this item and that Paul agreed it could be for the 2008 version and not a Supplemental change for 2005.

Paul said he followed up on the questions from last time and added the cost-benefit analysis. He said the benefit far outweighs the cost. He said for the current hog-wire mesh it is around 90 percent effective in keeping animals off the right of way while the v-mesh is 98 percent effective, but it is a little more costly. Paul said the benefit far outweighs the cost with a 50 year life for the v-mesh. He said maintenance on it is virtually nil. He said there is no question that the v-mesh is the far better product and way to go. Paul asked if there were any questions.

Discussion points were:

- Lloyd asked for a review of the cost-benefit analysis as he couldn't follow it. Paul said he took the reduction in numbers of accidents for the two options and computed an eight percent reduction. He went on to explain how he calculated the results. Jim commented about the 50 year life span.
- Lloyd said he couldn't see where the average cost per accident came from. Paul said it came from research in Joe Perrin's report done for UDOT.
- Robert Hull said they don't use an average crash cost across severity lines because it skews numbers. He said those numbers are pretty much meaningless. Paul asked why. Bob went on to explain. Paul said the costs are weighted based on the number of accidents in each category. Lloyd said he comes up with a lower number but that it is still a positive benefit. Paul said he didn't quite agree, but okay. Bob again said the numbers are wrong.

- Barry again asked if this impacts anything for approval. Bob commented on the situation indicating he didn't think the ratio was 275 to 1 but may be closer to 2 to 1. Bob went on to say the approval should not be based on the 275 to 1 cost - benefit.
- Jim asked as he has in the past if there are other things we can do with the money that have better cost - benefit ratios. He said it isn't necessarily that they have a positive ratio. Are we better off spending this money somewhere else? Jim asked Bob if the 2 to 1 was a good deal based on his previously stated concerns. Bob said based on the 2 to 1 it was, but compared to other safety related things they do it probably isn't.
- Jim said that is why we are here, to ask those types of questions. Bob compared it to rumble strips. Jim asked Bob if he was objecting to the methodology used to compute the cost - benefit ratio. Bob said he didn't think it was appropriate, adding that if the ratio comes out to be positive and that is what approval is based on then he was fine with it. Jim said he didn't think it was enough that it was just positive.
- Jim asked Paul if the statistics he used was for high accident areas. Paul said the fence was designed for use in just high accident areas. Shana asked if the numbers used were from high accident areas. Paul said yes and that it was not State wide. Paul went on to further explain what he had in the analysis.
- Various costs were discussed. Jim commented that it looked like we were nearing the end of the discussion asked if anyone had a motion.

Motion: Lloyd Neely made a motion to approve 2008 Standard Specification 02822 and Standard Drawings FG 1A, FG 1B, FG 2A, and FG 2B as presented.

- Bob said he would like to make a different motion. Jim said a second was needed and then there could be more discussion.

Motion: Seconded by Tim Biel so discussion could continue.

- Bob said he wanted to make a motion based on his concerns and that the item be tabled and looked at again. He said he would want more information on the cost - benefit analysis, the 50 year life, and related maintenance.
- Jim asked if there were any models available on fence and maintenance costs that could be used to make the determination.
- Bob said the bottom line is that the goal of the Department is to improve safety and reduce fatalities and serious injury crashes. He said if this item is just to reduce property damage only then it doesn't float to the top.

- Lloyd said what we are looking at is a Type G fence on a Standard Drawing with other types and that the cost - benefit analysis needs to be on the project level. Jim said that is a good point. Shana said it should be considered location specific.
- Randy said we may also want to look at where we require fence not just the type. He said that always seems to be an issue in project design.
- Someone commented that this fence is only for high migratory areas.
- Jim asked Bob if he was so uncomfortable with the methods that he felt it wouldn't have a positive cost - benefit. Jim asked for his best guess. Bob thought it would have, making several comments to include location. Bob commented about the actual crash numbers, asking if it is an actual problem or something we induced ourselves by other actions. Bob also commented about moving the problem ten miles down the road.
- Paul said the animals can move and that is where we need to address another issue, that being wild-life crossings. Paul said animals need to get across the road.
- Bob said what is really generating these numbers is faulty. There may be things that are causing the problems and we need to address that. Paul said that is part of the analysis.
- Jim said there is a motion, second, and additional discussion. Hearing no additional discussion he then called the question to approve the item.

Motion: Passed with one no vote (Robert Hull). Jim noted the negative vote.

3. Standard Specifications 13551, General ATMS Requirements; 13552, Ramp Meter Signals and Signing; 13555, ATMS Cabinet; 13556, Closed Circuit TV Assembly; 13558, Highway Advisory Radio (HAR) System (new section); 13559, Non-Intrusive Detector System (new section); and 13594, Fiber Optic Communication and Standard Drawings AT 1, Legend Sheet; AT 2, Ramp Meter Details; AT 3A, Ramp Meter Sign Panel; AT 3B, Ramp Meter Sign Panel; AT 4, Typical Ramp Meter Signal Head Mounting; AT 5, Ramp Meter Loop Installation; AT 6, Conduit Details; AT 7, Polymer-Concrete Junction Box Details; AT 8, ATMS Cabinet; AT 9, ATMS Cabinet Disconnect And Transformer Frame; AT 10, Deleted (Replaced by AT 10A and AT 10B); AT 10A, CCTV Mounting Details (new drawing); AT 10B, CCTV Settings (new drawing); AT 11, CCTV Pole and NID Mounting Details (new title); AT 12, CCTV Pole Foundation For CCTV Poles (new title); and AT 13, HAR Pole Detail (new drawing) (Agenda Item 3) – Presented by Mike Adams and Todd MacGilvray.

Todd highlighted the specification changes, covering the major changes.

For 13551, Todd said the submittal requirements for as-builts were changed to before final inspection. He said the depth of foundation removal was changed per a request from Structures.

For 13552, Todd said there were a number of changes to make the section consistent with Standard Drawings AT 2 - AT 5 to accommodate a three section and two section signal head. He said that is to meet MUTCD and FHWA requirements. He said he would cover it in more detail on the drawings.

Moving on to 13555, Todd said information for a pole-mounted cabinet was added.

On 13556, he said the option for camera lowering poles was added to meet installation needs.

For 13558, Todd said this is a new specification and is for site preparation. He said it would be on a wood pole as steel would interfere with radio operation. He said a fiber glass pole was considered but was cost prohibitive. He said that may change in the future to allow that option.

Moving to 13559, Todd said this is another new specification to provide guidance on where and how to mount the non-intrusive detector.

On 13594, Todd said the splice requirements were opened up to allow for more enclosures.

Todd said those were the major changes to the specifications, adding that there were also minor changes to all the specifications.

Todd then moved on to cover the drawing changes.

He said AT 1 added more abbreviations to cover items on the other drawings.

On AT 2 through AT 5, Todd said a number of changes were made and that he expects more minor changes based on comments here from Roland. He said AT 2 is adding a supplementary option for a plaque if they put detail C AT 2 on a ramp instead of a cross street. He said the sign would be placed above the "Meter On" sign.

Moving on to AT 6, Todd said the table 2 reference was added to all details. He said note 2 was also modified to detail how much Open Graded Surface Course can be used for the Hot Mix Asphalt.

On AT 7, Todd said on the box detail they made clear the amount of penetration of the conduit into the box as well as clarify other items on the drawing. He said the collar thickness was changed from 8 to 6 inches.

Discussion points were:

- Jim said in reviewing this he saw a methodology that is just outstanding, adding that he sees comments were solicited from many people, with most of those with expertise far greater than most of those around the table here. He said he sees comments that time after time were taken into account and dealt with. Jim said with that methodology the things that have taken place have been covered. Jim commented that the Committee should have reviewed that information prior to the meeting and if they didn't mind he would just ask if they had any questions or comments about any of the specifications or drawings. He asked Todd if there were any specific items that he wanted to cover.
- Roland said that he recommends putting the HAR poles and camera poles at 1.5 times the clear zone. Todd concurred. Jim asked if that would be a comment that would go in the log for incorporation in the drawings before final submittal to Barry. Todd concurred, adding that those apply to AT 11 and AT 13.
- Barry said it looks like four drawings have modifications based on his notes, AT 2, AT 3A, AT 11, and AT 13. Someone commented that there might be an editorial change on AT 5. Todd says it shows the preference for the cabinet to be on the right side instead of the left.
- Mont asked about a specification on flowable fill. Clarifying Mont asked if a contractor can go someplace to figure out what he is suppose to put in as flowable fill. Todd said yes, in AT 6 and 7 as well as the conduit specification.
- There was no additional discussion.

Motion: Shana Lindey made a motion to approve 2008 Standard Specifications 13551, 13552, 13555, 13556, 13558, 13559, and 13594 and Standard Drawings AT 1, AT 2, AT 3A, AT 3B, AT 4, AT 5, AT 6, AT 7, AT 8, AT 9, AT 10A, AT 10B, AT 11, AT 12, and AT 13 as discussed and modified and for 2008 the deletion of AT 10. Seconded by Robert Hull. Passed unanimously.

Jim commented to both Todd and Mike about the good job done on this item and said he wished all our submittals were done to this level.

Barry made a general comment that all items approved from today's meeting will be for the 2008 version with no publishing for the current 2005 version unless something during the remainder of the meeting changes that.

4. Standard Specifications 02893, Overhead Sign Structure (new section) and 13557 Variable Message Sign (Agenda Item 4) – Presented by Jason Richins.

Jason said he worked with Todd to get these changes made. Jason said they are removing the poles from the ATMS sign specification because it is the same as the overhead sign.

Jason said that way there is only one specification for the pole instead of two that could cause problems in the future.

He said he had one addition, referring to agenda package page 170. Jason said he was connected by Universal Steel regarding the type of tests allowed. In article 2.1, paragraph D1 the suggestion was to add ASTM A 36. Jason also suggested adding 35,000 psi to the same paragraph.

Discussion points were:

- Barry pointed out that article 1.3 would have to be updated to add that reference.
- Jim asked if the addition was increasing competition. Jason said because we have the chemical composition at the top they are restrictive for normal steel. He said they are required because of galvanizing and if not required the galvanizing looks different colors.
- Boyd asked about the impact of the change for additional steel. Jason said it just gives another option. Jason said when the pipe comes out it is stamped with the test and meeting those standards. He said the addition gives more options for finding pipe that meets the standards. He said that should bring the price down because they don't have to look so hard to find the correct steel.
- Boyd asked Todd to discuss the changes to the VMS specification as only half the assignment was covered so far.
- Todd said in Section 13557 all the parts related to structures was removed after meeting with the Structures Division and getting things up to date with materials specifications and sequences. He said once those were reviewed and approved they decided it was a good idea to move those parts over to the overhead sign specification to separate the structure from the VMS.
- Todd said an ATMS designer doing one of these kinds of structures would have to include an additional specification, adding that it makes more sense this way.
- There was no additional discussion.

Motion: Boyd Wheeler made a motion to approve 2008 Standard Specifications 02893 and 13557 as discussed and modified. Seconded by Randy Park.

- There was a comment to change the title of the section. There was a follow up asking if this section is intended to be used with other signs other than just VMS. Boyd said yes, but if we change it as recommended and have overhead signs/VMS then it would be interpreted correctly.

Motion: Boyd accepted the recommended change to the motion to include a title change. Randy also concurred. Passed unanimously.

5. Standard Specifications 03372, Thin Bonded Polymer Overlay; 05835, Modular Expansion Joint (new section); and 07105, Water Proofing Membrane (Agenda Item 5) – Presented by Jason Richins.

Jason said they have been using a Special Provision for Thin Bonded Polymer Overlay for a while now. He said they are now comfortable bringing it forward to become a Standard. Jason said Modular Expansion Joint is a new section as well. He said they used the Expansion Joint (05832) Standard as a starting point and used LRFD Construction Specifications and Legacy Special Provisions to create this version. For Waterproofing Membrane, Jason said it was mostly editorial changes and that they took out the low temperature flexibility test.

In Section 03372, Article 1.5, paragraph D, Jason said they needed to update the requirement for the warranty letter to go to the Engineer in addition to the Bridge Operations Engineer who was already listed. He said it goes to the Engineer first but that they want to make sure the Bridge Operations Engineer also gets a copy as that person handles the warranty letter and the warranty on this item.

Discussion points were:

- Randy asked about the tracking of the letters and how the Bridge Operations Engineer handled the letters. Shana said they have a data base that includes when the item was put down.
- Jim asked Jason if he attempted to contact any of the suppliers of the item. Jason said he had not. Jim said in the past they have had questions from various suppliers as to whether our specifications are exclusive or somewhat exclusive.
- Shana asked about the change to the temperature requirements. Jason said he didn't think there was any temperature test change to this section (03372). Comment indicated the temperature change was the removal of the low temperature flexibility test in Section 07105. Shana said so there was no temperature change in Section 03372.
- Jim asked if more than one product meets this specification. Shana said there are other products that we are starting to use. Boyd said there are two types of polymers that are specified by this, the Type 1 and the Type 2. He said one has one supplier and the other multiple suppliers.

- Jim asked what differentiates the use of Type 1 or Type 2. Boyd said they typically take the recommendation of the Bridge Operations Group on which type they want for that facility. Jim asked when would they recommend one or the other. Boyd said if it is an Interstate, high volume, high risk for the Department they go with the premium product. He said if they can handle a little less risk and the volumes are less they go with the other type. Shana said they don't like to go with the other one because of funding constraints.
- Lloyd asked about Table 4 in Section 03372 and what it is telling us. Jason said it is just the makeup of the rock that is being accepted in this case. Lloyd asked if they have to hit those percents by weight exactly. Jason said the way he understands it is that it is Washington stone as listed in item 5 above (the specification). Boyd said they would update the table titles to better indicate requirements.
- Stan said he thought it would be a good idea for suppliers to review the section. Comment indicated that would have to be done by the October meeting in order to get the section in the 2008 edition.
- Stan said we need the availability for several contractors to bid, not just one. Boyd said any contractor can bid but there is only one supplier for one type of product. Boyd said he knows the Bridge Operations Group is concerned because we have had isolated failures. He said they want to make sure we get a quality product. Jim asked if the failures are with the exclusive Type 1 or the more allowable Type 2. Shana said Type 1. Boyd said because of the location of some of the failures it may not be a product problem but an installation or bridge issue.
- There was no additional discussion.

Motion: Shana Lindsey made a motion to approve 2008 Standard Specification 03372 as discussed and modified. Seconded by Robert Hull. Passed unanimously.

Sections 05835 and 07105 were discussed next.

Jason said 05835 is a new section. He added that it does show changes from the Special Provision that was used, pointing those out.

Discussion points were:

- Jim asked about the watertight test in Article 3.10, also referring to the deletion of "Integrity" from the name. He wanted to know how the test was accomplished. Jason said the way he understands the test it is that sand bags are put down and then the area filled up with water. He said if water does not seep through after one hour then it passes.

- Jim asked if anyone has ever seen that test out on the site. Boyd said they did the previous week on the Provo Canyon project.
- Randy asked when we talk about bridge elements like joints, waterproof membrane, and things like that is there any special consideration we need to be taking when we do rapid bridge construction or that needs to be put in these specifications. Boyd said he knows it has been incorporated into the other major specifications. He said he didn't know if there was anything specific short of concrete set time and we already reference the specification that we put that acceleration in so for the most part he thought we capture that. Jason said this section does reference the 72 hours to keep traffic off the expansion joint system.
- Jim said he wants to get back to the test, asking who does the test. Boyd said the contractor and typically we would have to get people out there to agree the test passed and to go on. Boyd said we defeat the major purpose of the joint if they are leaking day one. He said a major deterioration of bridges is leaking joints and that these steps are to ensure the contractor does quality work. Stan said this is analogous to the test we do on storm drains. Boyd concurred.

Being no further discussion on Section 05835, Jason moved on to Section 07105. He said the main change was the removal of the Vermont DOT Low Temperature Flexibility Test. He said he could not find the test during his research. He said patching concrete was added and that there were no other changes to this section.

Discussion points were:

- There was no discussion on Section 0705.

Motion: Boyd Wheeler made a motion to approve 2008 Standard Specifications 05835 and 07105 as presented. Seconded by Shana Lindsey. Passed unanimously.

6. Standard Specifications 03924, Structural Concrete Repair (new section); 03933, Parapet/Parapet End Modification; 03934, Structural Pothole Patching; and 07921, Sealing Existing Concrete Slope Protection Joints and deletion of Sections 03921, 03922, 03923 & 03935 (Agenda Item 6) - Presented by Jason Richins.

Jason said they had first updated five sections (03921, 03922, 03923, 03935, and 03924). When that was done he said Karl suggested incorporating them into one section. Jason said 03924 is being submitted as a new Standard because there was so much red-line in the section after incorporation of the other sections.

He said for Section 03933, the changes were editorial as were many of the changes in Section 03934. In Section 03934, Rapid Setting Repair Mortar was added.

Discussion points were:

- Randy referring to the submittal sheet comments from Tyler (actually from Karl to Tyler at ACEC) asked about the statement “Definitions are now required in the current spec writers manual.” Patti said all sections will include as a standard five articles. She said if there are no definitions the article is still listed with a “Not Used.” She said that was previously approved by the Standards Committee.

Jason went on to say the remaining changes in 03934 and those in 07921 were mostly editorial.

Discussion points were:

- There was no further discussion.

Motion: Boyd Wheeler made a motion to approve 2008 Standard Specifications 03924, 03933, 03934, and 07921 as discussed and modified and for 2008 the deletion of Sections 03921, 03922, 03923 and 03935. Seconded by Stan Burns. Passed unanimously.

7. Standard Specification 01355, Environmental Protection (Agenda Item 7) – Presented by Jerry Chaney.

Jerry said one of the things they did was to add clarification language in a few places. He said the first one being in “Hazardous Materials - Discovered During Construction.” He said they added a reference where people can go to determine if what they in fact have discovered is a hazardous waste. Jerry said they also included a 24-hour phone number at DEQ. He said basically the same language was added to “Hazardous Material - Contractor Caused.”

In the “Streams” article Jerry said they added better language on what needs to be done if working in or adjacent to a natural stream channel providing clearer guidance to follow.

Jerry said they also provided better direction on what should happen if historic or archaeological items are discovered during construction. Jerry pointed out the contact information. He said that was basically it on changes to the section.

Discussion points were:

- Someone asked about Article 1.11. Jerry said the name of the article was changed from “Noise and Vibration Control” to just “Noise Control” because there is no standard on the amount of vibration that is allowable at this point in time. Jerry said they talked to the Division of State History with respect to historic buildings and there is not a construction specification that you can have that sets acceleration and not harm a structure. He said the vibration issue has no definition for what you can do. Jerry said since there is no definitive limit it was deleted.

- Jerry said when there is an historical building in the project area they consult with the Division of State History for information to be inserted in the project.
- Jim asked if we do “before” surveys, commenting that it is not part of this specification. He asked if it is a different specification or special provision. Jerry said he thought it was part of a special provision but is not something they have required. He said they can look into adding that item in here.
- Jim then said he was interested in what a contractor is supposed to do when encountering hazardous waste. Jim referred specifically to Article 1.6, paragraph D. Jim said he wasn’t sure the contractor would know exactly what the Department wanted in this case. Jerry said what they want the contractor to do is deal with it to the satisfaction of the Department of Environmental Quality (DEQ). Jerry said that might mean picking it up and moving it to an approved disposal facility. Jim said comments appear to indicate they want some sort of Department control over helping the contractor decide the way to do that. Jim said he doesn’t see that in the specification language. Jim said he wondered if saying “consult with the Engineer” gives the Department the ability to work with the contractor on those solutions. Jim said there is a huge unknown dealing with DEQ. Jim said it is interesting that in a contract between the Department and the contractor we are telling him to deal with a third party. Jerry said they would not just direct the contractor to the third party, but would be involved. Jerry added that the statement in the specification does not state that. Jim suggested looking at I-15 specifications to see if something can be used from there.
- Referring to Article 1.11, paragraph B, Barry said the part referring to definitions needs to be moved to Article 1.4 the correct location for definitions.
- Referring to Article 1.13 on archaeological discoveries, Jim said he thought the detail there could be mimicked in the hazardous waste area. Jim then commented on the methodology in 1.13 and the risk.
- Jim said based on the discussion it looks like this one will be back next time.
- Barry pointed out that the October meeting is the last chance to get changes put in the new spec book.

Action Item: Jerry Chaney to review meeting comments and update specification accordingly for the October 2007 meeting.

8. Standard Specification 09972, Painting for Structural Steel; 09991, Cleaning and Repainting Structural Steel; and 09992, Cleaning and Overcoating Structural Steel (Agenda Item 8) – Presented by Bob Nash.

Bob said some of the changes to Section 09972 included corrections to references and editorial updates. He went on to point out the major changes. Bob said submittals were updated to include adding contractor submission of a quality management plan and submittal of daily reports. Bob said they removed the AISC category III painting endorsement as a qualification because it was not stringent enough. He said they also added information on materials mix and application. Bob said grinding information was also updated based on requests from their inspectors. He said some information in the specification was just moved to others parts of the section.

Bob said the changes to the other sections were similar to this. Bob reiterated that the changes in the submittal area were the biggest change.

Discussion points were:

- Jim asked if there were any questions.
- Referring to Section 09972, Article 3.5, paragraph E, someone asked about the reference to the US Bureau of Mines and if it was current. Bob said that wasn't changed and comes from the current Standard. Does that entity still exist? Discussion referred back to the submittal sheet and if this should be OSHA or MSHA. Bob said he had someone checking but had not heard back yet. Bob said he doesn't have a good answer to the question.
- Stan suggested that Bob check into this and come up with the proper wording.
- Barry asked if this would effect any approval or would it just be an update after. Comment indicated it would be a change as appropriate after approval.
- Boyd said they would work with Standards and asked if there were any other questions.
- There were no other questions or further discussion.

Motion: Boyd Wheeler made a motion to approve 2008 Standard Specifications 09972, 09991, and 09992 as discussed and modified and if needed update as discussed. Seconded by Tim Biel. Passed unanimously.

9. Standard Specifications 05822, Bearing; 05831, Expansion Joint Modification; and 05832, Expansion Joint (Agenda Item 9) – Presented by Bob Nash.

Bob covered the major changes. In Section 05822, he said the title was changed from “Expansion Bearing” to “Bearing.” He said the references were updated as were payment procedures. Bob said placement markings were added for elastomeric bearing pads. Bob said the intent of the changes to this section was to make it more inclusive.

Discussion points were:

- Tyler said that Karl had suggested rewording Article 3.8 on the Watertight Integrity Test. Bob said that was in Section 05831 to be covered next.

Bob continued with Sections 05831 and 05832. He said the changes were mostly updates to include correcting references. Bob said the Joint Systems List in 05832 was updated to show the two available systems instead of the reference to the products list. He said they also added the requirement to use only one strip seal system on a single project. For the lubricating material Bob said that was changed from a Federal specification to meeting manufacturer’s recommendations.

Bob covered the watertight integrity test next. He said the time was changed to one hour to match the test in the modular specification (05835). He said it use to be two hours. Bob said the fabrication requirements were also changed.

Bob said that parts of the sections that were identical now just refer to the other section. Bob said those were the major changes to the three sections.

Discussion points were:

- Referring to document page 291, Section 05831 on the watertight integrity test, Tyler asked if that is the same test covered in 05835. Boyd said yes. Tyler said the name of the article was changed in the other section but not here. He asked if that was something that could be referred to once in all the sections. Boyd said possibly but this is a different system than the modular one. Boyd said it could be done. Boyd suggested having the requirement in Section 05831 and have 05835 reference this one instead of the other way around because 05831 is probably used 80 percent of the time. Boyd said modular bridges are very expensive and uncommon. Tyler said he thought it would be easier for the contractor if he thought it was the same test. Boyd said they would make the necessary changes.
- Lloyd said Section 05832 calls this part Field Quality Control. Boyd said that is because it includes other requirements.
- There was no further discussion.

Motion: Boyd Wheeler made a motion to approve 2008 Standard Specifications 05822, 05831, and 05832 as discussed and modified. Seconded by Tim Biel. Passed unanimously.

10. Standard Specifications 02645, Precast Concrete Box and Three-Sided Culvert Structures; 02646, Concrete Box Culvert (new section); and 03412, Prestressed Concrete (Agenda Item 10) – Presented by Ray Cook.

Ray said Section 02645 was revised and updated in preparation for the 2008 specifications. He said references were updated and submittal items were updated with more complete information. He said the damproofing requirement was added for all culverts, not just precast as noted in the submittal sheet. He said other miscellaneous changes were made.

Ray said Section 02646 is a new specification. He said this section allows the substitution of precast concrete box culverts for cast-in-place ones. He said the bid item would be “lump sum” and that the contractor would be able to build the box culvert as detailed or the substitute. Ray said the section also references Section 02645 for precast concrete box culvert requirements.

Discussion points were:

- Barry asked about the new section coming in October that covers damproofing. Barry said Section 02645 references the new section (07111) but is fine because nothing would be effective until the 2008 version. Barry said that if for some reason Section 07111 is not approved then this section will have to be updated.
- Ray said something came in at the last minute from industry. He said it was to reference a different ASTM that was based on an LRFD design. Ray said they had further discussions with the industry representatives and did more investigation. Ray said that specification was not quite ready for adoption so the comment was withdrawn. In response to a question Ray said it would be ready in about a year. He said at that time they would reevaluate it and possibly adopt.
- Lloyd asked about the second submittal sheet. Barry said that it should have been a separate agenda item instead of one item with two submittal sheet. Barry said it would be covered once this submittal is complete.
- There was no further discussion on these two items.

Motion: Boyd Wheeler made a motion to approve 2008 Standard Specifications 02645, and 02646 as presented. Seconded by Stan Burns. Passed unanimously.

Section 03412 was discussed next.

Ray said this one was also updated for the 2008 specifications. He said the major changes included updating references, reorganizing material and construction items to make sure they are in the correct location, updating the submittal article to be consistent with other specifications, adding requirements to comply with PCI fabrication tolerances, and other miscellaneous changes.

Discussion points were:

- Stan commented about earlier comments by Randy and how these specifications relate back to rapid bridge replacement. Stan asked if there was anything we should be aware of in this section that should be added or deleted. Ray said this section is specific to pretensioned, precast, prestressed concrete members typically on prestressed girders but could be applied to prestressed deck panels. Boyd said they could use prestressed techniques. Boyd said he couldn't think of any requirement modifications.
- In response to comments from Robert Miles on the PCI certification in 1.5 A7, Boyd said the PCI certification is not as rigorous and not straight across the board and said he thought it would improve over time and become a requirement. Boyd said they intentionally chose the word "prefers," knowing it does not carry any power.
- There was no further discussion.

Motion: Stan Burns made a motion to approve 2008 Standard Specification 03412 as presented. Seconded by Boyd Wheeler. Passed unanimously.

11. Standard Specification 02861, Precast Retaining/Noise Walls and Standard Drawings SW 2, Noise Wall Placement Options; SW 3A, Precast Concrete Noise Wall 1 Of 2; SW 3B, Precast Concrete Noise Wall 2 Of 2; SW 4A, Precast Concrete Retaining/Noise Wall 1 Of 3; SW 4B, Precast Concrete Retaining/Noise Wall 2 Of 3; SW 4C, Precast Concrete Retaining/Noise Wall 3 Of 3 (new drawing); SW 5, Precast Pilaster Post (new drawing), and SW 6, Precast Concrete Panel Surface Texture Options (new drawing) (Agenda Item 11) – Presented by Ray Cook.

Ray said the revisions are due to changing noise wall panels to full-height panels, updating aesthetic requirements, and preparing for 2008 standard specification and drawing book. He said SW 2 was updated to provide a more complete description of wall placement options. The panels were redesigned to require the full height panels. Ray said the drawings were modified to require a form liner texture in place of the exposed aggregate surface that is very labor and time intensive and thus very expensive. He said the form liner would actually be a similar or less cost than the current panel. Ray said the texture is in addition to the 5 inch panel thickness that is required for design so you have a 1 inch allowed on each side to provide adequate relief for the form liner.

Ray said some standard texture options were developed on SW 6. He said the thinking was that it would be beneficial to our fabricators to have some standard textures.

Ray said on SW 3A and SW 4A they added a more aesthetic low cost end treatment. For SW 4B, Ray said they added a transition from the retaining/noise wall to the retaining wall only for situations that require it. He went on to say details were added to SW 5 for a pilaster post similar to what was used on the I-15 reconstruction project.

Ray said for all these aesthetics items the intent is for the information to be specified on the roadway plans.

He said it was their intent to develop a drawing for terminus elements similar to what is on I-15 that would go with the pilaster posts but that was not ready for this meeting.

On the specification, Ray said they updated the section to reflect the changes to the drawings. He said the references were also updated and that they reorganized the section so the materials and construction requirements were in the correct location and made other minor changes.

Ray said SW 6 did not print correctly in the package. He handed out corrected drawings to show photos at the top of the drawing.

Discussion points were:

- Barry asked Ray if the printing issues have been resolved. Barry said the Microstation file was too large and wasn't usable. He said that part was fixed but the PDF conversion still needs to be corrected. Barry then asked if the photos are really needed on the drawing or could they be provided elsewhere and let the drawing just cover the details. Ray said the photos give a better indication of the texture they are looking for. Barry said that really does not apply on a drawing. Barry agreed with the comment that a picture is "worth a thousand words" but not on the drawing. Boyd said he thought the picture added a lot of value. Barry said if the photos stay then all the issues need to be worked out so the drawing works properly.
- Robert Hull said he agreed with the usefulness of the picture, adding that you have to look at the implications to the production of the manuals and potentially how the rest of the manual is produced and the cost. Barry said the first time trying to print the drawing the problem crashed the computer and the drawing could not be printed.
- Boyd asked if there were any other questions on the specification or drawings.

- Stan said he had a question on SW 4C in the middle of the drawing or on SW 4B in the middle. Referring to what he calls “ears” Stan asked about cracking if that problem has been solved. Boyd said they were unaware of a cracking issue so they have not any changes to the posts. He said all their changes were to the panels. Some parts of the discussion could not be heard, but Stan did comment on wear and tear being part of the issue. Boyd said that is something they need to design for. Boyd said the columns are not designed for impacts so they expect that the columns would fail when impacted.
- Boyd said they do have very tight fabrication tolerances on the posts and very minimum cover. Boyd said they could reinvestigate the issue and make the columns stouter if that is the desire. Stan said he would be fine if it was just looked at. Boyd said they would contact their Central Materials people and Traffic and Safety and compile how big an issue it is.
- There were no additional comments.

Motion: Stan Burns made a motion to approve 2008 Standard Specification 02861 and Standard Drawings SW 2, SW 3A, SW 3B, SW 4A, SW 4B, SW 4C, SW 5, and SW 6 discussed and modified and with his (Stan) request to double check on the issue of columns. Seconded by Randy Park. Passed unanimously.

Action Item: Boyd to research column cracking problem and if needed update the drawings.

12. Standard Drawings SN 1, Bridge Load Limits Signs (removed from agenda); SN 2, School Speed Limit Assembly; SN 3, Overhead School Speed Limit Assembly; ST 3 Deletion; ST 3A, Typical Pavement Markings (new drawing); ST 3B, Typical Pavement Markings (new drawing); ST 3C, Typical Pavement Markings (new drawing); and ST 3D, Typical Pavement Markings (new drawing) (Agenda Item 12) – Presented by Wes Starkenburg.

Wes said the changes to SN 2 and SN 3 is related to the Department moving away from the use of wooden posts. He said the school zone signs were redone to shown mounting on wood posts instead. Referring to ST 3A, ST 3B, ST 3C and ST 3D, Wes said the drawings came from the old ST 3 drawing that was old and crowded. Wes said in the process they made some changes to various striping details to be more in line with current practices.

Wes said on the ST drawings he just handed out, ST 3D has changed since being submitted for the agenda. He said it deals with where we transition from the dotted line to the regular broken line. He said he made the changes in pen on the copy handed out to help see the changes. Wes asked if there were any questions or comments on any of his drawings.

Discussion points were:

- Barry asked Wes about his comment before the meeting about the version of the drawings that was actually put in the package. Wes said the final drawings that they wanted to go to the Committee were not the ones sent to Standards. He said the parts missing dealt with editorial changes in correcting spelling errors and the wording of the notes. Wes said they were not significant as to impact review and approval.
- Referring to ST 3 A, Jim asked about the information referring to “No Passing Zones.” He said in the Lane Reduction detail it shows delineation but the upper detail does not and he wondered about that. Jim asked Wes to talk him through that and if this drawing should have the delineation hardware so we know where pavement markings are suppose to go on rural two-lanes. Wes said he didn’t have the answer to that. Jim said it is interesting that most of the other drawings in this item have no signs or delineators. He said he wondered about the consistency in the drawings.
- Roland said the reason for the signs and delineators is that this is a special case of what is required on a lane reduction. He said the other delineators are just according to other Standards. He said they could be put on the drawing but they are basic delineation.
- Shana said she didn’t know if all the stuff is needed on the roadway for things that pertain to pavement marking, pass, no pass, or lane drop.
- Wes commented about saying something once and not repeating it on several drawings. Jim said he wondered about that but also wondered whether this drawing would give someone enough information about what needs to be there for the pavement markings. Jim said Roland’s comment was right on because of the special case of the lane drop.
- Roland said it is no different whether you have passing or no passing. Jim said no, it is, adding that we have delineators for where the no-pass zone starts. Someone commented that the information is on other drawings, asking if it should be referenced here. Wes said they will make adjustments to the drawing indicating this is a special case. Jim said he was specifically asking about the “Pass, No Pass” markers on the upper drawing.
- Jim said it is interesting to him that we have this many drawings on pavement markings and that he wonders about the MUTCD and what it has on pavement markings. Jim asked if our pavement markings were significantly different from the MUTCD or is there just not enough information in the MUTCD. Robert Hull said what you are seeing on our drawings is more of a clarification. He said our drawings provide a little more of an explanation.

- Wes said one of John Leonard's things is not repeating what is already in the manuals so when we show something it is meant to be either where we are different or as Roland said it is in the MUTCD but not being done correctly in the field. Wes said that is the intent.
- Boyd asked about the deletion of SN 1 and if it will be brought back in the future. Wes said they proposed deleting SN 1 but it was determined there was a need so it was dropped from the submittal. Boyd said the Bridge Operations Group is looking at SN 1 and other related drawings and sometime in the future will have updates. Wes said that was why the drawing was pulled from the submittal.
- Roland commented on the school zone sign saying that a note needed to be added on posts because it is referenced in their school manual and the UDOT school manual. Wes concurred. This would add a note 8 to SN 2.
- There was a comment on ST 3C with respect to the text "Exit Only" on the Lane Drop Exit Ramp detail being at an angle. Wes said they are correcting that, but this version didn't show the change.
- Randy commented about the painted island on ST 3D, saying that has not been done for years. Shana said as long as you have an edge line you don't have to paint the island. Wes said this is not a raised island. Randy asked that the detail be cleared up. Wes said that is the area where they would like to make some editorial changes. He referred to the changes as two options, raised island and pavement marking island.
- There was no further discussion.

Motion: Robert Hull made a motion to approve 2008 Standard Drawings SN 2, SN 3, ST 3A, ST 3B, ST 3C, and ST 3D as discussed and modified and for 2008 the deletion of ST 3. Seconded by Shana Lindsey. Passed unanimously.

13. Standard Drawings GW 1 Deletion; GW 1A, Raised Island (new drawing); GW 1B, Raised Island and Plowable End Section (new drawing); SN 7 Deletion, SN 7A, Placement of Ground Mounted Signs (new drawing); and SN 7B, Placement of Ground Mounted and Barrier Mounted Signs (new drawing) (Agenda Item 13) – Presented by Wes Starkenburg.

Wes said GW 1 was split into two drawings. He said the raised island was positioned back in the crosswalk or back from the intersection where there is no crosswalk to minimize or reduce the number of hits on the nose. Wes said in GW 1B, the slipbase details and the breakaway posts were added.

In that there were no comments at the time Wes moved on to the SN drawings. He said SN 7 was split into two drawings. He said one of the significant items on this is the details that show the position and height of the signs. Wes said one is a rural, non-pedestrian area where the sign can be slightly lower and where we have pedestrians it is shown at a higher level whether there is a sidewalk or not. Wes said another addition is the angle placement so the sign can be read while approaching.

Discussion points were:

- There was a question on mounting brackets and if the drawings will be brought next time. Wes said Glenn is handling the mounting bracket hardware for the signs.
- Wes said a lot more drawings will be coming for the October meeting.
- Referring to Jim's earlier comments, Stan said John did a great job contacting many stakeholders and responding to the comments either adding the information to the drawings or explaining why the comments were not incorporated.
- Jim commented that while traveling in other states he said he noticed that rather than the solid yellow line in the median as specified in GW 1A, they simply sprayed the island itself. Jim said he guessed that is allowed in the MUTCD. Roland said that is two different things, stating that one is a pavement marking and the other is identifying an island. Jim said you don't usually have both, right. Discussion continued on delineation, edge line, and island painting.
- Randy asked if the M2 curb details were also on another drawing. He said when doing an overlay the islands just start disappearing. He said they have a policy on how to handle that. He thought something more specific might be needed. Wes asked if there is something required on their part. Barry asked if an action item was needed.
- Robert Hull asked Wes if they had looked at GW 2 yet. Wes said no.
- There was no comment on making an action item or further discussion.

Motion: Robert Hull made a motion to approve 2008 Standard Drawings GW 1A, GW 1B, SN 7A, and SN 7B as discussed and modified and for 2008 the deletion of GW 1 and SN 7. Seconded by Stan Burns.

- Jim asked for clarification on the motion and if it was for the complete list of drawings. Jim said Roland had asked a question that led him to believe we were going to talk about GW 2 sometime in the future. Jim asked if that is a different item. Barry said he was checking the log. Jim said he was alright with it.

Motion: Jim called the question. Passed unanimously.

14. Sub-Committee Update on other Standards Approvals (Agenda Item 14) – Presented by Robert Miles and Barry Axelrod.

Robert said they are putting together updated inputs and feel comfortable with the progress. He referred to the status charts being handed out by Barry. The charts list specification and drawing status by group or area with the responsible person getting a copy that pertains only to their respective area. Barry said there is a color code key with each set being handed out.

Barry briefly explained what was handed out. Robert said the Traffic and Safety, signals area has some red but that he talked to Larry earlier and was told they were on top of that.

Robert said they have a sub-group meeting coming up to go over several more items.

Discussion points were:

- Jim asked if they were anticipating that the October meeting will be a heavy duty meeting. Robert said yes. Jim told the members to come prepared to that meeting.

Robert went on to propose how the transition from the 2005 to the 2008 version and implementation would take place. He said they would like to send out a memo to all the design areas indicating the January start with a Priority 3. Robert said that would give people four weeks to complete the transition and that they would accept waivers for an additional four weeks to basically March 1, 2008. He said the waiver would have to come through his office. Robert asked the members if that plan was acceptable.

- Jim asked if anyone had any comments or discussion. Randy said let's get it done.
- Barry gave a brief update on the drawing book format. He said they are in the process of doing a survey on the use and format of the book, mainly on the binding of the book. Barry said some people still like to take the Supplemental Drawings and replace the existing drawing in their book. Barry said that can't be done with the current coil binding so they were looking at two options, the current and then a three-ring binder. Barry said both options would be available and users would be able to pick the type they wanted. The content would be the same. The three-ring binder would be maintained by the user to meet individual needs. Barry said the issue of changes would remain the same. Barry said that Patti had sent an email to Maintenance for them to survey their people to get an idea of what they wanted. Barry said there would not be a significant impact on their area and that both types would be available for sale. He said printing would not be an issue and would be done through State Printing.
- Jim thanked Robert and Barry for the scheduling information, indicating it took a big load off his mind. Jim said we still have a lot of work to do ahead of us.

- There was no further discussion on this item.

15. Review of Assignment/Action Log (Agenda Item 15)

Jim asked Barry to cover the Action Log.

Tim commented about item 5 and that it was approved. After checking the minutes from the last meeting Barry indicated he had the incorrect item on the log. It should have been Supplemental Specification 02789, Asphalt Slurry Seal Coat.

- Item 1, Supplemental Specification 01554. Barry said he had not received any information on this item. Barry said if changes are going to be made it has to be on the October agenda. The log indicated this item was due in August. Target date extended to October 2007.
- Item 2, Standard Drawings BA 4E, W-Beam Guardrail Installations and ST 8, Plowable Pavement Markers. Being looked at in relation to deleted sections 02762, Plowable Pavement Markers and 02773, Asphalt Concrete Curb. Barry said this was a check to make sure everything agreed between the specifications and drawings that were approved. Barry said if they don't see anything then it probably can be assumed there was no problem. He said they should have something to formalize the closure of the item.
- Item 3, Supplemental Specification 02822, Right of Way Fence and Gate and Supplemental Drawings FG 1A, 1B, 2A, and 2B. This item was approved.
- Item 4, Supplemental Specification 02735, Micro-Surfacing. Tim indicated earlier that the item is being worked on.
- Item 5, Supplemental Specification 02789, Asphalt Slurry Seal Coat. Same as item 4.
- The status report as handed out at the August 2007 meeting follows:

Action Item Update for August 30, 2007 Standards Committee Meeting

(As of August 15, 2007, 1:20 p.m.)

Item 1, Supplemental Specification 01554M, Traffic Control: New target date was set to August 2007 meeting during the April 2007 meeting. From John Leonard: We will incorporate it as requested by the Standards Committee into the Traffic Spec 01554. This will be done in the review and modifications to this spec, before the August deadline. No update received for the meeting.

Item 2, Standard Drawings BA 4E, W-Beam Guardrail Installations and ST 8, Plowable Pavement Markers: Target date no later than October 2007 meeting. No new information. Not due until October.

Item 3, Supplemental Specification 02822, Right of Way Fence and Gate and Supplemental Drawings FG 1A, FG 1B, FG 2 A, and FG 2B: Not approved during April 2007 meeting. Additional work needed to include coordination between Research and Enviromental. Target date no later than October 2007 meeting. On current agenda, Item 2.

Item 4, Supplemental Specification 02735, Micro-Surfacing. Update Sections 02735 and 02789 to meet sampling requirements. Target date August 2007 meeting. No information or files received when requested. Dropped from agenda.

Item 5, Supplemental Specification 02786, Open-Graded Surface Course. Tied to Item 4. Target date August 2007 meeting. No information or files received when requested. Dropped from agenda.

16. Meeting Improvements (on-going agenda item) (Agenda Item 16): Jim said the one thing that he liked very much was the comment form that many of the presenters used with their submittals. Jim said it was a good thing. Barry said Traffic and Safety, Structures, and ATMS use their own version quite extensively and send them with their inputs. Jim congratulated them and said that was great. Jim asked if that was something that is available. Barry said they could put something together and make a form available. He said right now they are just division generated.

Barry commented even with the record number of pages in the agenda they were done an hour early. Jim said he appreciated that.

17. Other Business: None

A motion was made, seconded, and approved to adjourn.

The next regular meeting of the Standards Committee has been scheduled for Thursday, August 30, 2007, at 8:00 a.m., in the 1st floor conference room of the Rampton Complex.

Approval of Minutes: The foregoing minutes were approved at a meeting of the Standards Committee held _____, 2007.

Assignment/Action Item Log

Date Initiated/Updated	Item #	Action	Assignments	Status	Target Date
August 25, 2005	1	- Supplemental Specification 01554, Traffic Control (originally tracked as 00555M, Prosecution and Progress, Limits of Operation): Coordinate the required action to have the process placed in the proper location, to the detail necessary and bring the recommendation to the Standards Committee for approval.	John Leonard	Open	October 2007 meeting
October 27, 2005		- Item not ready. To be reviewed by the Operations Engineer. Target date updated.	Tracy Conti Robert Hull		
February 23, 2006		- Direction being reviewed by upper management.			
April 27, 2006		- Still being review by upper management for direction.			
June 29, 2006		- No change other than item may be on hold.	Robert Hull		
August 31, 2006		- No change.			
November 30, 2006		- Item being reviewed. Changed to track as Section 01554.			
February 22, 2007		- Still being worked			
April 26, 2007		- This item was incorporated at the request of the Standards Committee into the Traffic Spec 01554. This will be done in the review and modifications to this spec, before the August deadline			
June 28, 2007		- No new information. Not due until August.			
August 30, 2007		- No new information. Past due.			

Date Initiated/Updated	Item #	Action	Assignments	Status	Target Date
April 26, 2007 June 28, 2007 August 30, 2007	2	- Standard Drawings BA 4E, W-Beam Guardrail Installations and ST 8, Plowable Pavement Markers to be looked at for updates related to the deletion of sections 02762, Plowable Pavement Markers and 02773, Asphalt Concrete Curb. For inclusion in 2008 version. - No new information. Not due yet. - No new information.	Robert Hull Mike Donovan (BA 4E) John Leonard (ST 8)	Open	No later than October 2007 meeting.
June 28, 2007 August 30, 2007	3	- Supplemental Specification 02735, Micro-Surfacing. Update Sections 02735 and 02789 to meet sampling requirements. - Updated specification needed.	Tim Biel	Open	October 2007 meeting.
June 28, 2007 August 30, 2007	4	- Supplemental Specification 02789, Asphalt Slurry Seal Coat. Tied to item 4. - Updated specification needed.	Tim Biel	Open	October 2007 meeting.
August 30, 2007	5	Standard Specification 01355, Environmental Protection. Review meeting comments and update specification accordingly.	Jerry Chaney	Open	October 2007 meeting.
August 30, 2007	6	SW Standard Drawings. Research column cracking problem and if needed update the drawings per agenda item 11 from August 30, 2007 meeting.	Boyd Wheeler	Open	October 2007 meeting.

Closed Items From Last Meeting (August 30, 2007)					
Date Initiated/Updated	Prior Item #	Action	Assignments	Status	Target Date
April 26, 2007	3	- Supplemental Specification 02822, Right of Way Fence and Gate and Supplemental Drawings FG 1A, FG 1B, FG 2A, and FG 2B to be brought back for approval at a later time. Research and Environmental to work together to gather more data and provide cost - benefit information.	Paul West and Research Division	Closed	Closed
June 28, 2007		- Post-meeting update: Information received.			
August 30, 2007		- Approved			

Standards Committee Agenda Items Section

Submittal Sheets, Supplemental Specification Drafts, Standard Drawing Drafts, and other supporting data for the October 25, 2007 Standards Committee meeting follows.

Standards Committee Submittal Sheet

Name of preparer: Jerry L. Chaney

Title/Position of preparer: Environmental Engineer

Specification/Drawing/Item Title: Standard Specification "Environmental Protection"

Specification/Drawing Number: 01355

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Numerous items in the current specification needed additional clarification to ensure compliance with environmental laws

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

Not Applicable

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

No response to date.

ACEC Comments: (Use as much space as necessary.)

One comment:

“1.11 E. Suggest eliminating the statement in parentheses - "(from a few hours to a few months)" - "variable and dependent upon the nature and condition of the discovered item" is sufficient.

Response – Comment incorporated.

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Construction Engineers

One comment:

Maybe you want to include the definition for “disclosure of hazardous waste”. I'm not sure how many people will look it up and therefore may not comply.

Response – Comment incorporated.

Contractors (Any additional contacts beyond “C” above.) - None

Suppliers – Not applicable

Consultants (as required) (Any additional contacts beyond “C” above.) - None contacted

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

One comment:

Section 1.9 NOISE AND VIBRATION CONTROL paragraph B 5 defines vibration as ground movements resulting from construction related activities. Paragraph C requires that construction work be suspended when "Project related construction noise or vibration does not meet specifications." The specification defines noise levels, but does not define a level of vibration or a way to determine when vibration becomes a problem. This needs to be defined to be enforceable.

Response – Comment incorporated

Others (as appropriate)

UDOT Region Environmental Staff

Comments:

1) Section 1.4, part D. regarding hazardous waste cleanup.

We shouldn't assume that UDOT is going to cleanup any hazardous waste encountered in construction. This can be very costly in delays, in performing the cleanup work, and in transportation and disposal.

The specification is written to dispose of the hazardous materials as extra work. It is directing and authorizing the contractor to proceed without regard to cost, without an approved plan, or without an approved change order. UDOT may elect to leave the waste in place for the responsible party to cleanup. When trenching through a LUST site for pipe, it may be reasonable to simply back fill the pipe with the excavated material and leave it for the responsible party to remediate.

Response - Comment incorporated, language clarified.

Rather than say the waste will be cleaned up to EPA and DEQ standards, the Contractor should be directed to notify the Engineer to obtain direction on how to proceed.

Response – Comment not incorporated, EPA & DEQ standards must be met

2) Section 1.6 Streams

When motorized equipment is planned for use in or near streams or other water bodies a SPCC plan should be required. Guidelines for the spill prevention control and countermeasure plan can be found on the EPA's website. I've always felt this was a weakness in our specifications. This is typically an agency requirement when there is a chance for contaminating water. The plan should include inspecting equipment for leaks and preventative maintenance of potential leaks. It should include having spill containment materials available. There should be phone numbers immediately available of who to notify in the event of a spill, such as a downstream public water supplier with a diversion for a treatment plant. One hydraulic line break on a piece of equipment in or near a stream can kill fish and otherwise highly impact a surface or subsurface water source.

Response – Comment not incorporated, new Storm Water Pollution Prevention Plan outline should serve the need described in this comment

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide) - Not Applicable

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)
No impacts expected
3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

All potential users and interested parties will be trained on the revised specification via special meetings and conference breakout sessions

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price. - None
2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming). - None
3. Life cycle cost. - Not applicable

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Benefits include additional clarification and information provided by the revised specification.

H. Safety Impacts? - None

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Some sections of the current specification contain language that is unclear or unenforceable. The proposed revisions will remedy this situation.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

SECTION 01355

ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.1 GENERAL PROVISIONS

- A. Comply with all Federal, State, local laws and regulations, and provisions of this Section.
- B. Prevent pollution of streams, lakes, ponds, and reservoirs with sediment, fuels, oils, bitumens, chemicals, or other harmful materials and pollution of the atmosphere from particulate and gaseous matter.
- C. Use Best Management Practices to prevent hazardous material releases by segregating wastes, providing secondary containment and having spill kits and absorbents on hand.

1.2 RELATED SECTIONS **Not Used**

1.3 REFERENCES

- A. ANSI
- B. Title 40, Code of Federal Regulations (CFR)
- C. U. S. Environmental Protection Agency Regulations
- D. Utah Administrative Code
- E. Utah State Department of Environmental Quality Regulations

1.4 DEFINITIONS

Not Used

- A. Receptor - An occupied residential dwelling, church, hospital, school, outdoor stage, or structure confining other noise sensitive activities.
- B. Noise Sensitive Zone - The land enclosed within a 1500-ft radius circle of any receptor.
- C. Sound Level - The total sound pressure level from all concurrent construction activities related to the subject project, as measured with a

sound level meter using the A-weighting network (ANSI S1.4). The standard notation is dB(A) or dBA.

D. Percussive Noise - Short burst(s) of banging or clattering noise including but not limited to blasting, pile driving, and jack-hammering.

1.5 SUBMITTALS Not Used

1.6 HAZARDOUS MATERIAL - DISCOVERED DURING CONSTRUCTION

A. Immediately suspend work in the area and ~~_notify the Engineer_~~ if abnormal conditions are encountered or exposed during construction that indicates the presence of a hazardous material, toxic or hazardous waste.

1. Treat the conditions with extreme caution.
2. Abnormal conditions include, but are not limited to, the following: presence of barrels; buried storage tanks; above ground tanks; obnoxious odors; excessively hot earth; stained and discolored soils; smoke; unidentifiable powders, sludges, pellets; or any other condition that could be a possible indicator of hazardous material, toxic or hazardous waste.

BB. Execute the following notifications if hazardous waste is a-discovered ~~petroleum-based or hazardous waste spill occurs~~ that meets the definition for disclosure as defined in Title 40 CFR Part 261, Subpart D – Lists of Hazardous Wastes. Refer to <http://www.udot.utah.gov/go/standardsreferences>.

1. Notify the Engineer immediately after the discovery.
2. Notify the Utah Department of Environmental Quality (DEQ) in accordance with R315.9 of Utah Administrative RulesCode. 24-hour phone number: (801) 536-4123.
3. Notify the DEQ in writing within five calendar days of the discovery.

C. Contact the Engineer to initiate development of a remediation plan in accordance with Utah State Department of Environmental Quality and the United States Environmental Protection Agency (EPA) regulations and requirements.

D. Dispose of hazardous material, toxic or hazardous waste under the direction of the Engineer, in accordance with the remediation plan, requirements and regulations of the Utah State Department of Environmental Quality and the United States Environmental Protection Agency.

EG. Resume operation in the affected area when directed by the Engineer. Continue working in other areas of the project, unless otherwise directed by the Engineer.

~~D. Dispose of the hazardous material, toxic or hazardous waste under the requirements and regulations of the Utah State Department of Environmental Quality and United State Environmental Protection Agency. 1. Consult with the Engineer on all issues related to the disposal of hazardous substances.~~

12. Perform necessary work required to dispose of these materials as extra work.

23. Disposition of waste materials requiring special procedures by certified personnel will be arranged by the Department with qualified persons to dispose of the material.

1.7 HAZARDOUS MATERIAL - CONTRACTOR CAUSED

AA. Execute the following notifications if a petroleum-based or hazardous waste spill occurs that meets the definition for disclosure as defined in Title 40 CFR Part 261^{7.1}, Subpart D – Lists of Hazardous Wastes. Refer to <http://www.udot.utah.gov/go/standardsreferences> for the Electronic Code of Federal Regulations Web site.

1. Notify the Engineer immediately after the discovery of any the spill defined as a reportable release which includes spills that are:
 - a. greater than 25 gallons
 - b. released to a water body.
2. Notify the Utah Department of Environmental Quality (DEQ) in accordance with R315.9 of Utah Administrative RulesCode. 24-hour phone number: (801) 536-4123.
3. Notify the DEQ in writing within five calendar days of the discovery.

B. In the event of a petroleum or chemical spill:

1. Immediately respond to a spill <25 gallons with spill kits.
2. For spills >25 gallons, implement measures to minimize the spread of contaminants.

C. Capture and dispose of the spilled materials under the direction of the Engineer in accordance with the requirements of the State of Utah Department of Environmental Quality and the United States Environmental Protection Agency.

DB. Capture and dispose of spilled material according to the requirements and regulations of the DEQ. Document the spill and response action and submit a copy to the Engineer.

EG. Pay for all required clean-up operations.

1.8 STREAMS

A Any work in or adjacent to a perennial or ephemeral stream or river requires a General Permit 40 (stream alteration permit) issued by the Utah Department of Water Rights (Utah Administrative Code: Rule R655-13 Stream Alteration).

1. Adhere to the General and Special Conditions associated with the permit.
2. Conform to stream disturbance limits identified in the plans..

B. If a stream alteration permit is not issued for the project and work needs to be done in or adjacent to a stream, obtain approval from the Utah Division of Water Rights before proceeding. If construction activity increases water turbidity in the stream by 10 NTUs or more notify the Utah Division of Water Quality. C. When working in a live stream, use a dike or barrier to separate temporary work areas located in streams from the main stream. Minimize sediment from entering streams.

D. Use filtration, settling basins, or other methods to treat sediment-laden water before allowing it to enter a water body.

1.9 OPEN BURNING

A. Do not conduct open burning along highway rights-of-way without approval orders from the Executive Secretary of the Utah Division of Air Quality.

1.10 ABRASIVE BLASTING - VISIBLE EMISSION STANDARDS

A. **Visible Emission Standards:**

1. Abrasive blasting outside of Weber, Davis, Salt Lake and Utah Counties: Do not discharge into the atmosphere opacity darker than 40 percent for a period or periods aggregating more than three minutes in any one hour.
2. Abrasive blasting inside Weber, Davis, Salt Lake or Utah Counties where the performance standards in this article, paragraph C are used: Do not discharge into the atmosphere opacity darker than 20 percent for a period or periods aggregating more than three minutes in any one hour.
3. Abrasive blasting inside Weber, Davis, Salt Lake or Utah Counties where the performance standards in this article, paragraph C are

not used: Do not discharge into the atmosphere opacity darker than 40 percent for a period or periods aggregating more than three minutes in any one hour.

B. Visible Emission Evaluation Techniques:

1. Read emissions from unconfined blasting at the densest point of the emission after a major portion of the spent abrasive has fallen out. Densest point will be between 6 ft and 25 ft from the impact surface of the abrasive blasting nozzle.
2. Judge emissions from unconfined blasting employing multiple nozzles as a single source unless each nozzle meets the emission and performance standards.
3. Read emissions from confined blasting at the densest point after the air contaminant leaves the enclosure.

C. Performance Standards: Any one of the following may be used as a performance standard.

1. Confined blasting
2. Wet abrasive blasting
3. Hydroblasting
4. Unconfined blasting using abrasives defined below:
 - a. Before blasting, the abrasive will not contain more than one percent by weight material passing a #70 U.S. standard sieve.
 - b. After blasting, the abrasive will not contain more than 1.8 percent by weight material 5 micron or smaller.
 - c. Abrasives reused for dry unconfined blasting are exempt from the requirements of "after blasting," but must conform to the requirements of "before blasting" above.

D. Abrasive Certification: Sources using the performance standard for unconfined blasting must demonstrate they have obtained abrasives from persons who have certified (submitted test results) to the Utah Air Quality Executive Secretary at least annually that such abrasives meet the requirements outlined above for abrasives.

1.11 NOISE CONTROL

- A. Identify haul routes and percussive noise sources that annoy sensitive receptors and prevent these sources from becoming a problem.

~~B. Definitions and Standards - Use terminology that meets applicable American National Standards Institute (ANSI) publications and commonly accepted practices of acoustical measurements.~~

- ~~1. Receptor - An occupied residential dwelling, church, hospital, school, outdoor stage, or structure confining other noise sensitive activities.~~
- ~~2. Noise Sensitive Zone - The land enclosed within a 1500-ft radius circle of any receptor.~~
- ~~3. Sound Level - The total sound pressure level from all concurrent construction activities related to the subject project, as measured with a sound level meter using the A-weighting network (ANSI S1.4). The standard notation is dB(A) or dBA.~~
- ~~4. Percussive Noise - Short burst(s) of banging or clattering noise including but not limited to blasting, pile driving, and jack-hammering.~~

B.G. Prohibitions - Suspend construction work under the following conditions:

1. Construction activity in a noise sensitive zone causes the sound level within 10 ft of the nearest receptor to exceed: 95 dBA in daytime (7 a.m. - 9 p.m.), or 55 dBA in nighttime (9 p.m. - 7 a.m.)
2. A noise sensitive zone on Sundays and State Holidays.
3. Project related construction noise does not meet specifications. Suspend the portion of construction work responsible for the problem until noise is reduced to the required noise standards.

C.D. Compliance:

1. Follow all local noise ordinances, except where a variance in accordance with local regulations has been granted.
2. Local noise ordinance variance does not provide an exemption from complying with the requirements of this article, paragraph C.

E.D. Percussive Noise:

1. Notify the Engineer at least two weeks in advance of any percussive noise activity that is expected to exceed the provisions of this article, paragraph C.
2. Coordinate notification of the public with the Engineer.

1.12 ENVIRONMENTAL CLEARANCE BY THE CONTRACTOR

- A. Obtain and provide the following environmental clearances before beginning project activity when adding or selecting any ground- or resource-disturbing features such as material (gravel, borrow or waste) sites, equipment staging sites, office sites, water lines, holding ponds, etc., not provided in the Contract:
 1. Cultural and Paleontological - Initiate consultation concerning proposed additional feature(s) with a Department staff archeologist. (Hiring a private archeological sub consultant and coordination with the Utah State Historic Preservation Office may be required.)

- a) The Department staff archeologist provides clearance to the Contractor via written notification. Refer to this Section, article 1.13.
 - 2. Threatened/Endangered Species: Obtain written clearance from the U.S. Fish and Wildlife Service.
 - 3. Wildlife Resources: Obtain written clearance from the State Division of Wildlife Resources.
 - 4. Wetlands: Obtain written clearance from the U.S. Army Corps of Engineers.
 - 5. Floodplains - Initiate consultation concerning the proposed additional feature(s) with the Region environmental staff.
 - a) Subsequent coordination with the Federal Emergency Management Agency (FEMA) may be required.
 - b) The Region Hydraulic Engineer provides verification of non-interference by the Contractor with a floodplain or compliance with FEMA guidelines to the Contractor.
 - 6. Prime, Unique, and Important Farmland - Initiate consultation concerning the proposed additional features with the farmland specialist with the Region's Environmental Engineer.
 - a) Subsequent coordination by the Contractor with the U.S. Natural Resources conservation service may be required.
 - b) The Region provides written clearance to the Contractor.
 - 7. Utah Pollutant Discharge Elimination System (UPDES) - Obtain UPDES permit for storm water discharge from Utah Division of Water Quality (DWQ).
 - a) Comply with the requirements of the permit including submittal of Notice of Intent (NOI) form to DWQ and development and approval of the storm water pollution prevention plan by the DWQ when required.
 - 8. Air Quality: Obtain construction approval from the Utah Division of Air Quality if construction project or area of disturbance outside of the project is in an area of air quality non-attainment for any pollutant.
- B. Contractor is responsible for all costs of pursuing and obtaining all the above clearances, and is not entitled to time extension for delays encountered in obtaining these clearances.

1.13 DISCOVERY OF HISTORICAL, ARCHAEOLOGICAL, OR PALEONTOLOGICAL OBJECTS, FEATURES, SITES, HUMAN REMAINS, OR MIGRATORY AVIAN SPECIES

- A. Immediately suspend construction operations in the vicinity (minimum 100-ft buffer around the perimeter) of the discovery if a suspected historic,

archaeological, or paleontological item, feature, or site is encountered, or if suspected human remains are encountered.

- B. Verbally notify the Engineer of the nature and exact location of the findings.
- C. The Engineer contacts the UDOT Region staff archaeologist, who will assess the nature of the discovery and determine the necessary course of action.
- D. Notify the Engineer who in turn notifies the Region Environmental Manager and the UDOT Wildlife Biologist if bats or migratory birds are discovered on structures.
 - 1. Coordinate to determine the necessary course of action.
- E. Protect the discovered objects or features and provide written confirmation of the discovery to the Engineer within two calendar days.
- F. The Engineer keeps the Contractor informed concerning the status of the restriction.
 - 1. The time necessary for the Department to handle the discovered item, feature, or site is variable, dependent on the nature and condition of the discovered item.
 - 2. The Engineer will provide written confirmation when work may resume in the area.

PART 2	PRODUCTS	Not used
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PART 3	EXECUTION	Not used
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END OF SECTION

Standards Committee Submittal Sheet

Name of preparer: Tim Biel
Title/Position of preparer: Engineer for Materials
Specification/Drawing/Item Title: Materials Dispute Resolution
Specification/Drawing Number: 01456

Enter appropriate priority level:

(See last page for explanation) 4

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

This section has been taken out of the new 02741 HMA and made into a stand alone spec that applies to all tested materials.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No change.

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at

<http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

See Below

ACEC Comments: (Use as much space as necessary.)

Responded with No comments

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Desna Bergold, Region Two

Construction Engineers

Karl Verhaeren

Contractors (Any additional contacts beyond "C" above.)

Has gone through Utah Pavement Council, including representatives from Staker-Parsons, Geneva, Granite

Suppliers

See above

Consultants (as required) (Any additional contacts beyond "C" above.)

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Others (as appropriate)

RME Group approved

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

No Change

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

No change

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Publishing the specification, notice will be given at Pavement Council.

- F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.
2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).
3. Life cycle cost.

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Has been removed from the HMA specification so that it can be applied to all tested materials. The defined process has led to many resolutions at the field level, allowing good material to remain in place, even when test results may not comply with the legalistic interpretation of the specs. This will now be applied to other tested materials.

- H. Safety Impacts?

None

- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

New document, but has been part of 02741 for last 7 years.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |
| Priority 4 | 2008 Book only |

SECTION 01456

MATERIALS DISPUTE RESOLUTION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Procedures for addressing disputed acceptance or verification results for the following materials on Department projects:
 - 1. Section 02056 – Common Fill
 - 2. Section 02721 – Untreated Base Course
 - 3. Section 02741 – Hot Mix Asphalt
 - 4. Section 02743 – Hot Mix Asphalt – Bike and Pedestrian Paths
 - 5. Section 02744 – Stone Matrix Asphalt
 - 6. Section 02752 – Portland Cement Concrete Pavement
 - 7. Section 02785 – Chip Seal Coat
 - 8. Section 02786 – Open-Graded Surface Course

1.2 RELATED SECTIONS

- A. Section 02056: Common Fill
- B. Section 02721: Untreated Base Course
- C. Section 02741: Hot Mix Asphalt
- D. Section 02743: Hot Mix Asphalt – Bike and Pedestrian Paths
- E. Section 02744: Stone Matrix Asphalt
- F. Section 02752: Portland Cement Concrete Pavement
- G. Section 02785: Chip Seal Coat
- H. Section 02786: Open-Graded Surface Course

1.3 REFERENCES

- A. AASHTO T 24: Obtaining and Testing Drilled Cores and Sawed Beams of Concrete

- B. AASHTO T 193: The California Bearing Ratio
- C. AASHTO T 312: Preparing and Determining the Density of Hot-Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor
- D. AASHTO T 324: Hamburg Wheel-Track Testing of Compacted Hot-Mix Asphalt (HMA)
- E. AASHTO TP 62: Determining Dynamic Modulus of Hot Mix Asphalt Concrete Mixtures
- F. Asphalt Institute Manual SP-1
- G. UDOT Materials Manual of Instruction

1.4 DEFINITIONS Not Used

1.5 SUBMITTALS

- A Engineering analysis within one week of receipt of test results or 24 hours prior to performing any work that may prevent the evaluation, correction or removal of the lot in question.
 - 1. Engineering Analyses will be accepted if based on test results performed by an AASHTO accredited lab that has performed a split-sample process with the Department.

1.6 DISPUTE RESOLUTION PROCEDURE

- A. The Contractor may dispute the validity of the Department's acceptance or verification tests.
- B. When disputing test results include, at a minimum, the following items in the engineering analysis:
 - 1. Data supporting the Contractor's test results. Data must be based on project quality control testing.
 - a. Split-sample testing performed within the applicable contract
 - b. Contractor's test data for the disputed results, along with all supporting test data and calculations for calculated values (i.e. Bulk Specific Gravity, Maximum Specific Gravity and Ignition Oven results for disputing VMA)
 - c. Successful Laboratory Correlation information when required by material specification
 - 2. Procedures or issues leading to disputed acceptance test results.
 - 3. Incentive/Disincentive calculations based on both Contractor and Department test values, individually.

- C. When construction schedule indicates that a reject lot will be covered within 48 hours, the Department immediately reviews the submittal to determine if it has merit. If merit is found, the Department immediately suspends work related to the lot in question. The Department reviews the analysis to identify possible discrepancies that can be resolved through validation testing based on the following:
1. Department performs repeat testing on remaining material from original Department test.
 2. Department personnel perform repeat testing in the presence of Contractor representative within a 24 hour time period.
 3. Use results to validate or invalidate original Department result. Validation test results may not be used in lieu of acceptance results.
 4. Base validation on results within two standard deviations (project acceptance samples) of original acceptance result. Remove invalidated test results from acceptance lot and reevaluate lot based on reduced sample size.
 5. The Engineer reviews the results and notifies the Contractor of any findings that affect the reject status of the lot along with the Department's position on whether the lot is to be removed or may remain in place at the pecuniary deduction for Reject Lot.
- D. Within three working days of receipt, the Resident Engineer, Region Materials Engineer, and Region Construction Engineer review the analysis and notify the Contractor in writing of acceptance or rejection. Notification of rejection includes the following:
1. Engineering basis for rejecting the Contractor's analysis, including specific points of objection.
 2. Department data and analysis to justify Department position.
 3. Time frame for removal of material or pay adjustment to be applied to the lot.
- E. When the Department concludes the engineering analysis has merit, the Department, in conjunction with the Contractor, immediately begins a review of the acceptance test results. The review includes, but is not be limited, to the following:
1. Independent Assurance review of all equipment and procedures and methods used for sampling, splitting, and testing.
 2. A review of the Department and Contractor's raw test data and calculations for documentation or calculation errors.
 3. Production and testing of additional correlation samples.
 4. Cross-witnessing of test procedures by Contractor Quality Control and Department personnel.
 5. Distribution of any other pertinent information.
 6. Discussion of other possible means for variation.

Note: If engineering analysis is initiated due to failure of statistical methods to verify Contractor testing and there is no net difference between incentive/disincentive based on Contractor or Department testing, the Engineer may verify contractor test values based on engineering analysis.

- F. Do not continue production related to the material type in question without concurrence from the Engineer or until differences in the test results are resolved.
- G. If errors in testing or reporting are discovered, the Department corrects the applicable test results and re-applies the acceptance/pay adjustment procedures.
 - 1. If errors are identified that cannot be corrected and the quality of a Hot Mix Asphalt or Stone Matrix Asphalt lot is in question, the Department may choose to evaluate the lot using the Hamburg Wheel Tracker (AASHTO T 324), or the Asphalt Pavement Analyzer (UDOT Materials Manual of Instruction Part 8-958: Standard Test Method for Determining Rutting Susceptibility using the Pavement Analyzer).
 - a. Use 5 stratified random samples cut from the roadway
 - b. The Region Materials Engineer and Resident Engineer decide, in conjunction with the Contractor, the status of the lot and associated pay adjustment, based on the following:
 - 1) Fatigue Life
 - 2) Stripping Potential
 - 3) Rutting Potential
 - 4) Expected Pavement Performance Period vs. Design Life
- H. If errors in testing cannot be identified, select an Independent Third Party (agreed upon by the Department and the Contractor) to witness sample splitting and testing by both the Contractor and the Department. The Independent Third Party identifies/produces additional material for split-sample testing.
- I. If testing errors are identified by the Third Party, the Department makes appropriate adjustments to the acceptance test results and re-applies the acceptance/pay adjustment procedures.
- J. The party responsible for the identified error pays for the services of the Independent Third Party.
- K. If no errors are identified, the Department evaluates the lot using the original testing results.
- L. Errors that are identified within the Department's testing result in a review of the Contractor's schedule and if appropriate, adjustments to the CPM. Time lost due to a rejected analysis is not credited to the CPM, and appropriate liquidated damages will be applied.

- M. The Contractor may request that “reject material to be removed” be left in place at a reduced pay. When requesting “reject material to be removed” be left in place include, at a minimum, the following additional items (as appropriate for the material in question) in the engineering analysis:
1. Determination of volumetric, durability and long-term structural properties from one or more of the following tests:
 - a. Hamburg Wheel Track Testing of Compacted Bituminous Mixtures; AASHTO T 324
 - b. Resistance of Compacted Bituminous Mixture to Moisture Damage; UDOT Materials Manual of Instruction Part 8-957.
 - c. Standard Test Method for Determining Rutting Susceptibility Using the Pavement Analyzer; UDOT Materials Manual of Instruction Part 8-958.
 - d. Dynamic Modulus Evaluation, AASHTO TP 62
 - e. PG Asphalt Binder Tests, SP-1
 - f. SuperPave Volumetric Properties, AASHTO T 312
 - g. California Bearing Ratio, AASHTO T 193
 - h. Coring and Testing Drilled Cores and Sawed Beams from Concrete Pavement, AASHTO T 24
 2. Recommendations for price adjustment based on expected long-term performance.
- N. The Department will take no further action after the response is submitted to the Contractor.

PART 2 PRODUCTS Not Used

PART 3 EXECUTION Not Used

END OF SECTION

Standards Committee Submittal Sheet

Name of preparer: John Butterfield/Tim Biel
Title/Position of preparer: Region Two Materials Engineer/Engineer for Materials
Specification/Drawing/Item Title: Microsurfacing
Specification/Drawing Number: 02735

Enter appropriate priority level:

(See last page for explanation) 4

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Rewrite and submission of current special provision based on changing some format regarding submittals and addressing some mix design and sampling procedures.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No change.

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

See Below

ACEC Comments: (Use as much space as necessary.)

Responded with No comments

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Desna Bergold, Region Two

Construction Engineers

Karl Verhaeren

Contractors (Any additional contacts beyond “C” above.)

Has gone through Utah Pavement Council, including representatives from Staker-Parsons, Geneva, Granite

Suppliers

Rusty Price, ISS – Part of original rewrite – *Granite requested that we include in-line testing of aggregates to allow easier blending of products during the process. This would be cheaper for the contractor and the Department. We had several discussions, and agreed that it was a valid request, but due to the unresolved questions of what to do with non-spec materials that were already on the road, we agreed that this should be dealt with through a special provision until we could iron out the specifics.*

Consultants (as required) (Any additional contacts beyond “C” above.)

FHWA (To be accomplished as part of the two-week process before submitting to the

Standards and Specifications Section for inclusion on the Standards Committee agenda.)
(This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Others (as appropriate)

RME Group approved

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

Changes are attached.

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

No change

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Publishing the specification, notice will be given at Pavement Council.

- F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

If anything, price will go down due to reduced handling.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

Currently no change.

3. Life cycle cost.

Should be increase due to elimination of marginal and inconsistent mix designs

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.)
(Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Less workload and better timing for Region Field personnel.

H. Safety Impacts?

None

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Document has been a special provision for at least three years. Changes were requested, in part, by industry to improve the mix design process and bring more in line with national procedures.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect **four weeks** later for projects being advertised.

Priority 4 2008 Book only

Supplemental Specification
2005 Standard Specification Book

SECTION 02735

MICRO-SURFACING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Products and procedures for mixing and spreading a properly proportioned mixture of aggregate, mineral filler, additives, polymer-modified asphalt emulsion, and water.
- B. Products and procedures for a cured mixture with a homogeneous appearance, a firm surface adhesion, and a skid resistant texture.
 - 1. Provide a micro-surface mixture that is capable of being spread in variable thickness cross-sections (ruts, scratch courses, and surfaces).

~~1.2 RELATED SECTIONS~~**1.2 RELATED SECTIONS**

- ~~A. Section 02745: Asphalt Material~~
- A. Section 02746: Hydrated Lime

~~1.3~~**2 REFERENCES**

- A. AASHTO M 17: Standard Specification for Mineral Filler for Bituminous Paving Mixtures
- ~~B. AASHTO M 29: Standard Specification for Fine Aggregate for Bituminous Paving Mixtures (Note: Not found in text. Delete here or add in text. Renumber as required.)~~
- ~~C. AASHTO M 85: Portland Cement~~
- D. AASHTO M 208: Standard Specification for Cationic Emulsified Asphalt
- ~~E. AASHTO T 2: Sampling of Aggregates~~

~~FE.~~ AASHTO T 11: Materials Finer Than 75 µm (No. 200) Sieve in Mineral Aggregate

~~FG. AASHTO T 19: Unit Weights and Voids in Aggregate (Note: Not found in text. Delete here or add in text. Renumber as required.)~~

~~GH.~~ AASHTO T 27: Sieve Analysis of Fine and Coarse Aggregates

~~HI.~~ AASHTO T 49: Penetration of Bituminous Materials

~~IJ.~~ AASHTO T 53: Softening Point of Bitumen

~~J~~

~~——J.~~ AASHTO T 59: Testing Emulsified Asphalts

~~K. AASHTO T 89: Determining the Liquid Limit of Soils~~

~~L. AASHTO T 90: Determining the Plastic Limit and Plasticity Index of Soils~~

~~MK.~~ AASHTO T 96: Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

~~LN.~~ AASHTO T 104: Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate

~~O. AASHTO T 112: Clay Lumps and Friable Particles in Aggregate~~

~~MP.~~ AASHTO T 176: Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test

~~QQ. AASHTO T 201: Standard Test Method for Kinematic Viscosity of Asphalt (Bitumens)~~

~~R. AASHTO T 278: Surface Frictional Properties Using the British Pendulum Tester~~

~~SPR.~~ AASHTO T 279: Accelerated Polishing of Aggregates Using the British Wheel

~~T.S. AASHTO T 308: Determining the Asphalt Binder Content of Hot Mix Asphalt (HMA) by the Ignition Method~~

~~T. AASHTO T 316: Viscosity Determination of Asphalt Binder Using Rotational Viscometer~~
AASHTO T 316: Viscosity Determination of Asphalt Binder Using Rotational Viscometer (Note: Can't delete. Added in Table 1.)

~~U. AASHTO TP 61: Determining the Percentage of Fractured Particles in Coarse Aggregate~~

~~QV.~~ ASTM D 6372-99a: Standard Practice for Design, Testing and Construction of Micro-Surfacing

~~RW.~~ ISSA A 143 Guidelines (~~Revised May 2005~~Current edition)

~~SX.~~ ~~UDOT Materials Manual of Instruction~~ (Note: Not found in text. Delete here or add in text. Renumber as required.)

~~TY.~~ UDOT Minimum Sampling and Testing Requirements

~~1.1.43~~ ~~CONTRACTOR SUBMITTALS MINIMUM SAMPLING AND TESTING REQUIREMENTS~~

~~_____A. Contractor Submittals~~

~~_____1. Mix Design, Provide the Engineer with Mix Design 10 days prior to beginning construction.~~

~~1. Meet requirements of this sSection, Aarticle 2.6. ASTM D 6372-99a~~

~~a. Test results for job mix design, ISSA A143.~~

~~_____1) Wet Cohesion: 30 minute and 60 minute, ISSA TB 139~~

~~_____2) Excess Asphalt by LWT Sand Abrasion, ISSA TB 109~~

~~_____3) Wet Stripping, ISSA TB 114~~

~~_____4) Wet track abrasion loss, one hour soak and six day soak, ISSA TB 100~~

~~_____10) Lateral displacement, ISSA TB 147~~

~~_____11) Classification Compatibility, ISSA TB 144~~

~~_____12) Mix Time, ISSA TB 113~~

~~2. _____~~

~~B. Provide the Engineer with the following for asphalt-/polymer emulsion with job-mix design.~~

~~1. Test report: Emulsified Asphalt~~

~~Test Report~~

~~1) Meets AASHTO M 208~~

~~2) Penetration AASHTO T 49~~

~~7) Softening point AASHTO T 53~~

~~8) Minimum Residue AASHTO T 59 (modified)~~

~~9) Minimum rotational kinematic viscosity, AASHTO T 209316 Meet the requirements of this sSection, article 2.1.~~

~~2. A sample of asphalt-/polymer emulsion with job-mix design.~~

~~a. 3. Sample of asphalt / polymer emulsion with job-mix design~~

~~e. A Ccertificate of analysis/compliance from the manufacturer for each shipment~~

~~4. Target gradation for combined aggregate and mineral filler.~~

~~5. Verification asphalt/polymer emulsion supplier adheres to *UDOT Minimum Sampling and Testing Requirements Section 508 Asphalt Emulsion Quality Management Plan.*~~

~~3C. Provide test reports for Mineral Aggregate.~~

~~1. a. Test Reports~~

~~1) Sodium Sulfate Soundness, AASHTO T 104~~

~~2) Sand Equivalent AASHTO T 176~~

~~3) LA Wear AASHTO T 96~~

~~4) Polishing value, AASHTO T 278, T 279 Meet the requirements of this Section, article 2.2.~~

~~4D. Provide verification that Hydrated Lime meets 02746.~~

~~E. Provide a Manufacturer's Mineral Filler: Certificate of Compliance for Mineral Filler materials meets AASHTO M 17.~~

~~5. Target gradation for combined aggregate and mineral filler.~~

~~6F. Provide Calibration documentation for each mixing unit that includes an individual calibration for each material at various settings, which can be related to the machines metering devices.~~

~~G. To make changes in the job-mix gradation:~~

~~1. Submit a written request for a change in the job-mix gradation.~~

~~2. Submit a new job-mix design if any changes in gradation are outside the gradation band allowed by the stockpile tolerance in Table 2.~~

~~7. Resident Engineer approved submittals.~~

~~B. Quality Assurance for aggregate stockpiles, performed by the Department~~

~~1. Aggregate stockpile sieve analysis, AASHTO T 2, T 27 / T 11~~

~~a. Stockpiles are approved a minimum of one and maximum of seven days prior to use.~~

~~b. One gradation per 500 tons of material (estimated) in stockpile.~~

~~c. Out of specification material will be rejected.~~

~~C. Documentation/Report~~

~~1. Verification asphalt/polymer emulsion supplier adheres to *UDOT Minimum Sampling and Testing Requirements Section 508 Asphalt Emulsion Quality Management Plan* from the UDOT website. Refer to <http://www.udot.utah.gov/index.php/m=c/tid=719> for dated, signed, qualified list printout.~~

PART 2 PRODUCTS

2.1 EMULSIFIED ASPHALT

- A. Use a CSS-1h, quick-set polymer-modified asphalt emulsion conforming to AASHTO M ~~208,208~~; delete the cement mixing test requirements.
- B. Mill or blend the polymer material into the asphalt or emulsifier solution prior to the emulsification process.
- C. ~~Submit a sample of the asphalt / polymer emulsion along with the job mix design to the Engineer for approval.~~ The asphalt-/polymer emulsion must parallel the standard from an established infrared spectrum characterizing the asphalt / polymer emulsion.

~~————— D. ——— Provide a certificate of analysis/compliance from the manufacturer for each shipment of emulsified asphalt to the Engineer~~

~~DE.~~ Modified Emulsion Residue, meet Table 1:

Table 1

TEST	DESCRIPTION	SPECIFICATION
AASHTO T 49	Penetration, 77°	50—80 40-90
AASHTO T 53	Softening point	135° Min
AASHTO T 59 (modified (a))	F Residue by distillation	62% Min.
AASHTO T 204 316	Kinematic Rotational Viscosity 275° F	650 CST CPS
(a) Modified distillation procedure: Heat emulsion residue to 350 270 ±± 10 degrees F and maintain that temperature for 20 minutes. Perform the distillation within 60 ±± 515 minutes		

2.2 MINERAL AGGREGATE

- A. Use 100 percent manufactured mineral aggregates that meet the following requirements:
 - 1. Clean and free from organic matter, clay balls or other detrimental substances.
 - 2. Maximum weighted sodium sulfate soundness loss of 15 percent. AASHTO T 104.
 - 3. Maximum loss by abrasion of 30 percent. AASHTO T 96.
 - 4. Sand equivalent of sixty or greater. AASHTO T 176
 - 5. Minimum polishing value of 31. AASHTO T 278, T 279
 - a. Performed on aggregate prior to crushing.
 - b. Predominantly limestone or dolomite aggregates will not be accepted.
- B. Select a job mix or target gradation within the gradation band. Base the mix design on this gradation. After the target gradation has been submitted the percent passing each sieve will not vary by more than the stockpile tolerance and still

remain within the gradation band. AASHTO T 11, AASHTO T 27. Refer to Table 2.

Table 2
Job-Mix Gradation Design Limits

Job-Mix Gradation Design Limits		
Sieve Size	Broad Band Gradation Percent Passing	Stockpile Tolerances
3/8	100	0
#4	70-90	±5
#8	45-70	±5
#16	28-50	±5
#30	19-34	±5
#50	12-25	±4
#100	7-18	±3
#200	5-15	±2

2.3 MINERAL FILLER

- ~~A.~~ Use Portland Cement, hydrated lime, or aluminum sulfate as specified in AASHTO M 17

2.4 WATER

- A. Use water that is potable and free from harmful salts or reactive chemicals and any other contaminants.

2.5 ADDITIVES

- A. Use additives as required to accelerate or retard the break-set of the micro-surface mix, to improve the resulting finished surface, or to increase adhesion
 1. Determine the initial additive quantities from the mix design for the micro-surface mix or individual materials.
 2. Use additives that are compatible with the other components of the mix.
 3. Obtain Engineer approval for use of additives.

2.6 JOB-MIX DESIGN

- ~~A. Provide the Engineer with test results and the proposed mix design from a UDOT approved laboratory 10 days prior to beginning construction.~~

- ~~4A.~~ Design in accordance with ASTM D 6372-99a
- ~~21.~~ Show each ingredient amount:
- Residual asphalt cement content, within 7.5 ± 2 ~~percent%~~ by dry total weight of aggregate.
 - Aggregate gradation (target) within the job-mix gradation design limits in Table 2.
 - Mineral filler, percentage by total dry weight of aggregate.
 - Polymer modifier 2.5 ~~percent%~~ minimum polymer solids based on the residual asphalt content.
- ~~32.~~ Identify additives as determined by design testing to control mix set times and adhesion.
- Provide acceptable percent limits for additives.
- ~~43.~~ Conform to the ISSA A143 specifications listed in Table 3.
- ~~54.~~ Use the same materials and aggregate gradation to be used on the project.

Table 3

ISSA TEST NO.	DESCRIPTION	SPECIFICATION
ISSA TB-139	<u>Wet Cohesion</u> @ 30 Minutes Minimum (Set) @ 60 Minutes Minimum (Traffic)	12 kg-cm Minimum 20 kg-cm Minimum or Near Spin
ISSA TB-109	Excess Asphalt by LWT Sand Abrasion	50 g/ft ² Maximum (538 g/m ² Maximum)
ISSA TB-114	Wet Stripping	Pass (90% Minimum)
*ISSA TB-100	<u>Wet-Track Abrasion Loss</u> One-hour Soak Six-day Soak	50 g/ft ² (538 g/m ²) Maximum 75 g/ft ² (807 g/m ²) Maximum
ISSA TB-147	<u>Lateral Displacement</u> Specific Gravity after 1,000 Cycles of 125 Pounds	5% Maximum 2.10 Maximum
ISSA TB-144	Classification Compatibility	11 Grade Points Minimum (AAA, BAA)
ISSA TB-113	Mix Time @ 77 degrees F	Controllable to 120 Seconds Minimum

* Perform the wet track abrasion test under laboratory conditions as a component of the mix design process.

- ~~B. To make changes in the job-mix gradation:~~
- ~~1. Submit a written request for a change in the job-mix gradation.~~
 - ~~2. Submit a new job-mix design if any changes in gradation are outside the gradation band allowed by the stockpile tolerance in Table 2.~~

2.7 EQUIPMENT

- A. Use mixing equipment specifically designed and manufactured to mix and place micro-surfacing.

1. Mix the material by an automatically sequenced, self-propelled micro-surfacing mixing machine, ~~which~~ that will be a continuous flow mixing unit, able to accurately deliver and proportion the aggregate, emulsified asphalt, mineral filler, control setting additive, and water to a revolving multi-blade double shafted mixer and discharge the mixed product on a continuous flow basis.
 2. Use a machine with sufficient storage capacity for aggregate, emulsified asphalt, mineral filler, control additive, and water to maintain an adequate supply to the proportioning controls.
 3. Use a machine capable of self-loading materials while continuing to place micro-surfacing.
 4. Equip the machine to allow the operator to have full control of the forward and reverse speed during applications of the micro-surfacing material.
 - a) Use original equipment manufacturer design for ~~the~~ self-loading device, opposite side driver stations, and forward and reverse speed controls. ~~will be original equipment manufacturer design.~~
 5. Use proportioning devices with individual volume or weight controls for proportioning each material, (aggregate, mineral filler, emulsified asphalt, additive, and water), to be added to the mix.
 - a) Use proportioning devices with controls properly marked, ~~and~~ which ~~that~~ ~~will~~ calibrate and determine the material output at any time.
- B. Use spreading equipment that will agitate and spread the mixture uniformly by means of twin-shafted paddles or spiral augers fixed in the spreader box.
1. Provide a front seal ~~to insure~~ that results in no loss of the mixture at the road contact point.
 2. Provide an adjustable rear seal that ~~will~~ acts as final strike-off.
 3. Use a spreader box with the rear strike-off designed and operated to produce a free flow of uniformly consistent materials to the rear strike-off.
 4. Use a spreader box with a suitable means provided to side shift the box to compensate for variations in the pavement geometry.
 5. Provide a secondary strike-off to improve surface texture, and with the same adjustments as the spreader box.
 6. When filling ruts with an average depth greater than one-half inch, use a rut filling spreader box specifically designed to fill ruts.
 - a) Apply micro-surface as a scratch-coat pass when required to fill ruts less than one-half inch, at the direction of the Engineer.
 - b) For ruts of over one-half inch, make multiple passes with the rut filling spreader box, at the direction of the Engineer.
 - c) Allow a twenty-four hour cure time after filling ruts before placing final micro-surfacing layer.
- C. Calibrate each mixing unit in the presence of the Engineer as follows:
1. Prior to using on the project.
 2. After repairs or as directed by the Engineer.

~~D. Provide calibration documentation of each mixing unit to include an individual calibration for each material at various settings, which can be related to the machines metering devices.~~

PART 3 EXECUTION

3.1 LIMITATIONS

~~3.1 LIMITATIONS~~

- A. Do not apply micro-surface during rain, when road surface moisture is present, or during other adverse weather conditions.
- B. Do not apply micro-surface if either the pavement or air temperature is below 50 degrees F.
- C. Do not apply micro-surface when the temperature is projected below 33 degrees F within 24 hours of placing micro-surface.
- D. Cease micro-surface operations when the weather or other conditions prolong opening road surface to traffic beyond two hours.
- E. Keep traffic off roadway surface until the micro-surface has cured.

3.2 STOCKPILING

- A. Construct individual 500 ton stockpiles of micro-surface aggregates.
 - 1. Engineer approves stockpiles a minimum of one and a maximum of seven days prior to use.
- B. Notify the Engineer a minimum of seven calendar days prior to micro-surface placement in order for the initial stockpiles to be sampled and tested for acceptance.
- C. Obtain the Engineer's written acceptance of a stockpile prior to its use in micro-surface.
- D. Remove material not meeting specifications from the stockpile area.
- E. The Department will retest corrected material for acceptance.

3.3 PREPARATION

- A. Clean the surface of all dirt, sand, dust, oil, and other objectionable material immediately prior to applying micro-surface.
- B. Allow un-sealed cracks to dry thoroughly prior to applying micro-surface when using water to clean the road surface.
- C. Cover manholes, valve boxes, drop inlets and other service utility entrances prior to surfacing.

3.4 APPLICATION

- A. Pre-wetting of the surface is allowed when required by local conditions by fogging ahead of the micro-surface box.
 - 1. Do not over apply, causing free water to sit on the pavement in front of the micro-surface box.
- B. Place micro-surface mix that meets the job-mix design.
 - 1. Control the ingredients proportions by metering or measuring devices on the micro-surfacing equipment.
 - a. Use readings from the metering or measuring devices to determine compliance with limits stated in the approved job-mix design.
 - 2. Limit Any increase or decrease in the amount of mineral filler added to the mix during production ~~will be limited to~~ ± 1 percent% of the job-mix design
 - 3. The emulsion submitted with the job-mix design will serve as the standard to assure the same emulsion is used throughout the project.
 - a. Should large enough disparities occur the Engineer may request a new job-mix design and re-approval of the micro-surfacing.
- C. Pass the mineral aggregate over a scalping screen prior to transfer to the micro-surfacing mixing machine to remove oversize material.
- D. Carry a sufficient amount of micro-surface in all parts of the spreader so that full width and complete coverage is obtained with no streaks or narrow spots.
 - 1. Avoid overloading the spreader.
- E. Apply micro-surface of proper consistency at an average rate of 24 to 30 lb/yd².
 - 1. Apply micro-surface for rut filling as required.
- F. Do not add additional water for any reason, once the mixture has been placed onto the road surface.
- G. Remove and replace the micro-surface if any of the following occurs:
 - 1. Lumping, balling, or unmixed aggregates.
 - 2. Separation of the coarse aggregate from the emulsion and fines.
 - 3. Excessive breaking of emulsion inside the spreader box.

4. Streaking caused by oversized aggregate.
5. Flushing or excessively rich areas appearing in the micro-surfacing after two hours from the time of placement.
6. Any measurable rutting, shoving or other evidence of premature deformation when exposed to traffic with re-approved micro-surfacing materials and procedures.

3.5 TEST STRIP

- A. Apply a test strip of at least 500 feet in length on the roadway before initial placement commences.
 1. ~~The test strip must achieve~~ initial set within 30 minutes and show no visual signs of distress when exposed to traffic action after curing for 2 hours.
 2. Become part of the completed item ~~If~~ the above conditions are present and all other requirements are met, ~~the test strip will become part of the completed item.~~
 3. Remove and replace the micro-surfacing at no expense to the Department ~~If~~ the test strip fails to meet the conditions stated above, ~~remove and replace the micro-surfacing at no expense to the department.~~
- B. Make necessary adjustments if test strip does not pass.
 1. Obtain approval from the Engineer prior to repeating the test strip process.
 2. The Engineer may require a new job-mix design if failures indicate an ingredient problem.

3.6 FINISHING DETAILS

- A. Place the micro-surface so the depth of each course does not exceed twice the maximum aggregate size.
- B. Do not create build-up when constructing longitudinal and transverse joints.
- C. Place micro-surface adjacent to concrete pavements or concrete curb and gutter with a straight longitudinal edge.
 1. Do not allow over-lap in these areas.
- D. Maintain straight lines at all locations.
- E. Place micro-surface at side streets and intersections out to right-of-way line.
- F. Use hand squeegees to spread micro-surface in areas that cannot be reached with micro-surface machine.
 1. Lightly dampen areas prior to mix placement.
 2. Provide complete and uniform coverage.
 3. Avoid unsightly appearance from handwork.

4. Use the same type of finish in hand worked areas as applied by the spreader box.
- G. Use construction paper or comparable products so all beginning and ending joint lines from each construction pass are straight.

END OF SECTION

Standards Committee Submittal Sheet

Name of preparer: John Butterfield/Tim Biel
Title/Position of preparer: Region Two Materials Engineer/Engineer for Materials
Specification/Drawing/Item Title: Hot Mix Asphalt
Specification/Drawing Number: 02741

Enter appropriate priority level:

(See last page for explanation) 4

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

This document has been a supplemental for a while and this rewrite is correcting some issues field issues regarding submittals, incentives/disincentives, mix designs, etc. Removed Dispute resolution section and a created a new section that applies to all tested materials. Updated route tables. Incorporated Recycled Asphalt – section 02969 now deleted. Have also moved some issue to the Materials Manual of Instruction and Minimum Sampling and Testing Requirements where possible.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No change.

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

See Below

ACEC Comments: (Use as much space as necessary.)

Responded with No comments

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Desna Bergold, Region Two

Construction Engineers

Karl Verhaeren

Contractors (Any additional contacts beyond “C” above.)

Has gone through 2 revisions through Utah Pavement Council, including representatives from Staker-Parsons, Geneva, Granite

Suppliers

See above

Consultants (as required) (Any additional contacts beyond “C” above.)

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Standards Committee Submittal Sheet

Name of preparer: John Butterfield/Tim Biel
Title/Position of preparer: Region Two Materials Engineer/Engineer for Materials
Specification/Drawing/Item Title: Optional Use of RAP
Specification/Drawing Number: 02969

Enter appropriate priority level:

(See last page for explanation) 4

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
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3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

This document has been included in the new 02741 HMA and can be deleted.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No change.

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at
<http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

See Below

ACEC Comments: (Use as much space as necessary.)

Responded with No comments

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Desna Bergold, Region Two

Construction Engineers

Karl Verhaeren

Contractors (Any additional contacts beyond "C" above.)

02741 Has gone through 3 revisions through Utah Pavement Council, including representatives from Staker-Parsons, Geneva, Granite

Suppliers

See above

Consultants (as required) (Any additional contacts beyond "C" above.)

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Others (as appropriate)

RME Group approved

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)
1. Minimum Sampling and Testing Guide (MS&T Guide)

No Change
 2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

No change
 3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Publishing the specification, notice will be given at Pavement Council.
- F. Costs? (Estimates are acceptable.)
1. Additional costs to average bid item price.
 2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).
 3. Life cycle cost.
- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)
- H. Safety Impacts?

None
- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Document has been a supplemental for last several years. Changes have been in response to industry and field crew comments about their challenges.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.
- Priority 2 Upon posting, this impacts projects being advertised.
- Priority 3 Upon posting, the approved standard takes effect **four weeks** later for projects being advertised.
- Priority 4 2008 Book only

Others (as appropriate)

RME Group approved

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

Testing does not change, only application for incentives and disincentives.

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

No change

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Publishing the specification, notice will be given at Pavement Council.

- F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

Gradation/ Density incentives are increased, VMA incentive eliminated. Should be about a wash.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

No change.

3. Life cycle cost.

Should be increase due to elimination of marginal and inconsistent mix designs

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Have clarified/eliminated most of the contentious issues for the field crews including submittal requirements, VMA calculations, field verification issues, etc.

H. Safety Impacts?

None

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Document has been a supplement for last several years. Changes have been in response to industry and field crew comments about their challenges.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect **four weeks** later for projects being advertised.

Priority 4 2008 Book only

Specification – Material 02741 HMA

Quality Assurance	Asphalt Binder Content and Sieve Analysis
Reference	AASHTO T 308 and AASHTO T 30
Lot Size	Production Day
Frequency per Lot	Four
Point of Acceptance	Grade behind the paver
Sampling Reference	MOI 8-984
Report/Form	

Specification – Material 02741 HMA

Quality Assurance	Asphalt Binder Content and Sieve Analysis
Reference	AASHTO T 308 and AASHTO T 30
Lot Size	Production Day
Frequency per Lot	If the fourth sample cannot be obtained the lot is evaluated on three test results.
Point of Acceptance	Grade behind the paver
Sampling Reference	MOI 8-984
Report/Form	

Specification – Material 02741 HMA

Quality Assurance	Theoretical Maximum Specific Gravity (Rice)
Reference	AASHTO T 209
Lot Size	Production Day
Frequency per Lot	Three in conjunction with VMA determination. (One determination is the average of two test results split from a single sample. The two test results must be within the “Acceptable Range of Two Results - single-operator precision” as defined in T 209, a third test result from the same sample may be necessary to have two

	within the range.)
Point of Acceptance	Grade behind the paver
Sampling Reference	MOI 8-984
Report/Form	

Specification – Material 02741 HMA

Quality Assurance	Voids in Mineral Aggregate (VMA) Determination
Reference	AASHTO T 312, R 35
Lot Size	Production Day
Frequency per Lot	Three, in conjunction with Rice Determination (one VMA determination is based on an average of two specimens)
Point of Acceptance	Grade behind the paver
Sampling Reference	MOI 8-984
Report/Form	

Specification – Material 02741 HMA

Quality Assurance	In-Place Density
Reference	AASHTO T 166
Lot Size	Production Day
Frequency per Lot	Ten: two in each of five equal sublots
Point of Acceptance	Grade after compaction, prior to traffic
Sampling Reference	MOI 8-984
Report/Form	

<u>Quality Assurance</u>	<u>In-Place Joint Density</u>
<u>Reference</u>	<u>AASHTO T 166</u>
<u>Lot Size</u>	<u>Production Day</u>
	<u>Five: one six-inch core in each of five</u>

<u>Frequency per Lot</u>	<u>equal sublots</u>
<u>Point of Acceptance</u>	<u>Grade after compaction, prior to traffic</u>
<u>Sampling Reference</u>	<u>MOI 8-984, center core on the visible line where the two adjacent passes abut at the surface ± 1 inch.</u>
<u>Report/Form</u>	

Specification – Material 02741 HMA

Quality Assurance	Thickness
Reference	Avg. of three measurements on each core recorded to 1/8 in.
Lot Size	Production Day
Frequency per Lot	Ten in conjunction with in-place density determination
Point of Acceptance	Grade after compaction, prior to traffic
Sampling Reference	MOI 8-984
Report/Form	

Specification – Material 02741 HMA

Quality Assurance	Smoothness
Reference	Standard Specification 01452
Lot Size	
Frequency per Lot	
Point of Acceptance	
Sampling Reference	
Report/Form	

Specification – Material 02056

Quality Assurance	Visual Acceptance of very small quantities of materials
Reference	Acceptance is limited to only materials being furnished from sources found satisfactory under normal sampling and

	testing procedures.
Lot Size	Not to exceed 100 tons per day or 1000 tons per project.
Frequency per Lot	One report for each day material is accepted.
Point of Acceptance	Grade
Sampling Reference	
Report/Form	Visual Inspection Report

SECTION 02741

HOT MIX ASPHALT (HMA)

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Products and procedures for ~~laying~~placing and compacting a surface course of one or more layers of HMA comprised of aggregate, asphalt binder, hydrated lime and other additives.
- B. ~~Mix materials at a central mixing plant.~~Option to incorporate Reclaimed Asphalt Pavement (RAP) materials into HMA pavement.

1.2 RELATED SECTIONS

- ~~A.~~ A. ~~Section 01452: Profilograph and Pavement Smoothness~~ (Reference deleted in text and not added.)
- ~~B.~~ B. Section 01456: Materials Dispute Resolution
- ~~BC.~~ BC. Section 02742S: Project Specific Surfacing Requirements
- ~~CD.~~ CD. Section 02745: Asphalt Material
- ~~DE.~~ DE. Section 02746: Hydrated Lime
- ~~EF.~~ EF. Section 02748: Prime Coat/Tack Coat
- ~~F.~~ F. ~~Section 02969: Optional Use of Reclaimed Asphalt Pavement (PG-Binder Projects Only)~~

1.3 REFERENCES

- A. AASHTO M 323: Superpave Volumetric Mix Design
- ~~B.~~ B. AASHTO R 35: Standard Practice for Superpave Volumetric Design for Hot-Mix Asphalt (HMA)
- ~~B.~~ B. ~~AASHTO T 11: Materials Finer Than 75 μ m (No. 200) Sieve in Mineral Aggregates by Washing~~

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~~CB.~~ AASHTO T 19: Unit Weights and Voids in Aggregate

~~D.~~ ~~AASHTO T 27: Sieve Analysis of Fine and Coarse Aggregates~~

~~E.~~ ~~AASHTO T 30: Mechanical Analysis of Extracted Aggregate~~

~~F.~~ ~~AASHTO T 85: Specific Gravity and Absorption of Coarse Aggregate~~

~~GC.~~ AASHTO T 89: Determining the Liquid Limit of Soils

~~HD.~~ AASHTO T 90: Determining the Plastic Limit and Plasticity Index of Soils

~~IE.~~ AASHTO T 96: Resistance to Abrasion of Small Size Coarse Aggregate by Use of the Los Angeles Machine

~~IF.~~ AASHTO T 104: Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate

~~KJ.~~ AASHTO T 112: Clay Lumps and Friable Particles in Aggregate

~~L.~~ ~~AASHTO T 166: Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface Dry Specimens~~

~~MK.~~ AASHTO T 176: Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test

~~N.~~ ~~AASHTO T 195: Determining Degree of Particle Coating of Bituminous-Aggregate Mixtures~~ AASHTO T 195: Determining Degree of Particle Coating of Bituminous Aggregate Mixtures (Still in text)

~~O.~~ ~~AASHTO T 209: Maximum Specific Gravity of Bituminous Paving Mixtures~~

~~PL.~~ AASHTO T 255: Total Moisture Content of Aggregate by Drying

~~QM.~~ AASHTO T 304: Uncompacted Void Content of Fine Aggregate

~~R.~~ ~~AASHTO T 308: Determining the Asphalt Binder Content of Hot Mix Asphalt (HMA) by the Ignition Method~~

~~S.~~ ~~AASHTO T 312: Method for Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor~~

~~T.~~ ~~AASHTO T 324: Hamburg Wheel Track testing of Compacted Hot Mix Asphalt (HMA).~~

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~~UN.~~ AASHTO TP 61: Determining the Percentage of Fractured Particles in Coarse Aggregate

~~V.~~ ~~AASHTO TP 62: Determining Dynamic Modulus of Hot Mix Asphalt Concrete Mixtures~~

~~W.~~ ~~ASTM D 2950: Test Method for Density of Bituminous Concrete in Place by Nuclear Method~~

~~X.~~ ~~ASTM D 3549: Thickness or Height of Compacted Bituminous Paving Mixture Specimens~~

~~Y.~~ ~~ASTM D 3666: Specification for Minimum Requirements for Agencies Testing and Inspecting Bituminous Paving Materials~~

~~Z.~~ ~~ASTM D 4561: Practice for Quality Control Systems for Organizations Producing and Applying Bituminous Paving Materials~~

~~AA.~~ ~~ASTM D 5506: Standard Practice for Organizations Engaged in the Certification of Personnel Testing and Inspecting Bituminous Paving Materials~~

~~BB.~~ ~~ASTM E 178: Practice for Dealing with Outlying Observations~~

~~CC.~~ ~~ASTM E 1274: Standard Test Method for Measuring Pavement Roughness Using a Profilograph~~

~~DDQ.~~ UDOT Materials Manual of Instruction, ~~Part 8~~

~~EEP.~~ UDOT Minimum Sampling and Testing ~~Guide~~ Requirements

1.4 SUBMITTALS

~~A.~~ ~~Submit mix ~~D~~esign at least 10 working days before paving; in accordance with Materials Manual of Instruction 960.~~

~~1.~~ ~~Submit materials and documentation in accordance with Manual of Instruction 960.~~

~~B.~~ ~~Submit verification that hydrated lime meets the requirements of Section 02746~~

~~C.~~ ~~Submit verification that Asphalt ~~B~~binder meets the requirements of Section 02745~~

~~D.~~ ~~Changes in job mix targets:~~

~~1.~~ ~~Submit a written request for a change in the job-mix gradation at least 12 hours ~~prior to~~before incorporating changes into production.~~

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- a. Include documentation supporting correlation between suggested target changes and mix design volumetric requirements. Either or both Department acceptance and/or Contractor QC testing data are acceptable.
 - b. Field volumetric mix design verification consists of three sets of two gyratory specimens run at the new target gradation and/or asphalt binder content or both. The Department's previous acceptance tests are acceptable for field verification.
 - c. If the field volumetric mix design meets the volumetric requirements, the Engineer, in consultation with the Region Materials Engineer, provides written concurrence of the verified field volumetric mix design.
 - d. If the field volumetric mix verification does not meet the volumetric requirements, submit a new laboratory volumetric mix design from a laboratory qualified by UDOT Central Materials. Allow at least four working days for verification.
2. The Department allows two minor target changes per project (non-retroactive) without penalty to contractor. Minor change is defined as a maximum of two screens being adjusted, each adjustment less than or equal to 5% percent of the total job mix gradation. All other changes will require volumetric mix design verification. The Department charges \$1000 for each additional minor target change.
 3. The Department performs up to two volumetric mix design verifications at no cost to the Contractor. The Department charges \$3000 for each additional laboratory and/or field verification required, including all laboratory or field volumetric mix design verifications required due to contractor initiated target changes.

E. Submit a new laboratory volumetric mix design if changes occur in the aggregate source, asphalt binder source or grade.

~~FF. UDOT Performance Data Products Listing (PDPL)~~

1.54 ACCEPTANCE

- A. Acceptance sampling and testing of material is in accordance with UDOT Minimum Sampling and Testing Requirements.
- ~~B. A lot equals the number of tons of HMA placed during each production day. The Department will:~~
- C. Gradation and Asphalt Binder Content
 - ~~1. Divide each lot into four sublots based on the scheduled production day.~~
 - ~~2. Take random samples behind the paver before any further compaction (UDOT Materials Manual of Instruction Part 8-984: Sampling Methods);~~

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and determine random numbers/locations from a random numbers table or generator. (UDOT Materials Manual of Instruction Part 8-981: Random Sampling)

- a. ~~Dispute Resolution Sampling~~—Increase sample sizes to accommodate paired-T testing. Split additional material with contractor-designated lab and continue until testing discrepancies between labs are identified and resolved, as defined in article 1.6. (UDOT Materials Manual of Instruction Part 8: Chapter 4, Appendix C)1. The Engineer evaluates a lot on the test results of four samples, with the following exceptions:

- a. If only three samples can be taken for the production day, compute incentive/disincentive using the test results from three samples.
- b. Add the lot to the next day's production if three random samples cannot be taken.
- c. Add the lot to the previous day's production for the final day's production if three random samples cannot be taken.
- d. When less than 900 tons are anticipated per production day, the lot may be increased to include up to three production days, when agreed upon in advance by both the Contractor and the Engineer.
- e. Evaluate with the appropriate number of tests "n" in Table 4:

32. The Engineer ~~informs~~ the Contractor of the time and place ~~for the of~~ sampling ~~not more than 15 minutes prior to~~ before the sampling.

D. Density and Thickness

1. Contractor obtains cores within two days after the pavement is placed. Materials Manual of Instruction 984.

- a. Engineer marks coring location for In-place density and Joint density cores. ~~of core sample.~~
- b. For In-place density, ~~if the random location for corings falls within one foot of the edge of the overall pavement section (outer part of shoulders), then move transversely to a point one foot from the edge of the pavement.~~
- c. Fill core holes with HMA or high AC content cold mix and compact.
- d. The Department witnesses the coring operation, ~~-takes possession of the cores immediately, and begins testing the cores within 24 hours for density acceptance.~~

2. Density Requirements

- a. The in-place target density is 93.5 percent of Maximum Specific Gravity F ~~for projects where the design overlay thickness is greater than 2 inches, the target for in-place density, including longitudinal joint density, is 93.5 percent of Maximum Specific Gravity.~~
- b. In-place target is 92.5 percent of Maximum Specific Gravity density F ~~for projects where design overlay thickness is less than or~~

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equal to 2 inches, the target for in-place density, including longitudinal joint density, is 92.5 percent of Maximum Specific Gravity.

d. Use the average of the Maximum Specific Gravity tests for each lot to determine density of cores.

e. Use Table 4 to determine PT for density.

fe. Acceptance for in-place density may be based on establishing a rolling pattern for bridge decks, utility work, traffic signals, detours, lane leveling, driveways, etc., or small projects with plan quantities less than 3000 tons.

g. Target density for longitudinal joint density is as listed in lines a and b of this article.

~~4. Conduct the following tests:~~

~~a. Asphalt Binder Content: One per subplot using ignition oven. AASHTO T 308~~

~~b. Aggregate gradation: One test per subplot on the residue of the ignition oven tests. AASHTO T 30.~~

~~c. VMA: 3 tests per lot. AASHTO T 312~~

~~d. Maximum Specific Gravity: Three per lot in conjunction with VMA determination. AASHTO T 209~~

~~5. Use the average of the Maximum Specific Gravity tests for each lot to determine density of cores.~~

~~6. Determine thickness of cores according to ASTM D 3549.~~

~~7. Add the lot to the previous day's production if the minimum number of samples cannot be obtained for the final day's production and evaluate with the appropriate sample size.~~

~~8. Add the lot to the next day's production if the minimum number of samples cannot be obtained, and evaluate with the appropriate sample size.~~

~~9. Retest the lot if an individual test from a subplot is deemed an outlier based on ASTM E 178, with 90 percent confidence.~~

~~B. The Engineer conducts the acceptance testing for asphalt binder content (AASHTO T 308), gradation (AASHTO T 30), VMA (AASHTO T 312), density (AASHTO T 166), and thickness (ASTM D 3549). For small projects with plan quantities of HMA less than 3000 tons or for work such as utility work, traffic signals, detours, lane leveling, etc., the Engineer may elect to accept material based upon visual inspection.~~

~~1. When acceptance is intended to be based upon visual inspection, the Engineer reserves the option of conducting any acceptance tests necessary to determine the material and workmanship meets the project requirements.~~

~~C. Obtain samples for density and thickness.~~

~~1. Divide the lot into five sublots of approximately equal sizes.~~

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2. — Obtain two cores per subplot, for a total of ten cores per lot, randomly as instructed, and in the presence of the Engineer within two days after the pavement is placed. (UDOT Materials Manual of Instruction Part 8-981: Random Sampling, UDOT Materials Manual of Instruction Part 8-984: Sampling Methods)
3. — If the random location for cores falls within one foot of the edge of the overall pavement section (outer part of shoulders), then move transversely to a point one foot from the edge of the pavement.
4. — Fill core holes with Hot Mix Asphalt or high AC content cold mix and compact.
5. — The Department takes possession of the cores immediately, and begins testing the cores within 24 hours for density acceptance.

D. — Density: The in-place target density for determining acceptance and incentive/disincentive is 93.5 percent of Maximum Specific Gravity density, AASHTO T 209, for projects where design overlay thickness is greater than 2 inches. For projects where design overlay thickness is 2 inches or less, in-place target density for determining acceptance and incentive/disincentive is 92.5 percent of Maximum Specific Gravity density, AASHTO T 209. In-place density is based on cores obtained in paragraph C and tested in accordance with AASHTO T 166. For small projects, with plan quantities of HMA less than 3000 tons or for work such as utility work, traffic signals, detours, or lane leveling, and when material is to be accepted on the basis of visual inspection per article 1.4, paragraph B, acceptance for density may be based upon establishing and maintaining a roller pattern to obtain maximum density without over-stressing the pavement.

1. — Use Table 4 with $n = 10$ to determine PT for density.
2. — When samples for gradation, asphalt binder content and VMA from lots are combined in order to obtain an appropriate sample size for evaluation, a lot for density determination is defined as the combined production days.

3.E. Thickness Requirements

- a. The Department accepts a lot for Thickness when:
 - Base acceptance on the average thickness of a lot. A thickness lot equals a density lot.
 - 1. — The same core samples taken for density will be used for thickness verification. ASTM D 3549.
 - 2. — The Department accepts a lot when:
 - a1) — The average thickness of all sublots is not more than $1/2\frac{1}{2}$ inch greater nor $1/4\frac{1}{4}$ inch less than the total thickness specified.
 - 2b) — No individual subplot shows a deficient thickness of more than $3/8\frac{3}{8}$ inch.
- b. Excess Thickness: The Engineer may allow excess thickness to remain in place or may order its removal.

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- 1) The Department pays for 50 percent of the mix for material in excess of the $+1\frac{1}{2}$ inch tolerance when excess thickness is allowed to remain in place
- cbe. Deficient Thickness: Place additional materials where lots or sublots are deficient in thickness. Minimum compacted lift is 3 times the nominal maximum aggregate size.
~~The minimum depth of compacted surface for correcting deficient thickness is 3 times the nominal maximum aggregate size.~~
 - 1)d. The Department pays ~~for for the quantity of additional material necessary to reach specified thickness to bring the surface to design grade.~~
 - 2)e. The Department pays for 50 percent of the mix ~~does not pay for additional for the quantity of additional material over specified thickness necessary above the design grade due to the minimum paving thickness required to achieve minimum lift thickness.~~
- 3) Minimum compacted lift is 3 times the nominal maximum aggregate size.
- ef. ~~The Engineer may allow excess thickness to remain in place or may order its removal. If directed, Remove and replace the entire depth of the course, if it is necessary to remove portions of the course.~~
- g.1) ~~The Department pays for 50 percent of the mix in excess of the $+1\frac{1}{2}$ inch tolerance when excess thickness is allowed to remain in place.~~
- dh. ~~The t~~ Thickness tolerances established above do not apply to leveling courses. However, check final surfaces in stage construction.
- ei. Thickness acceptance for thin lift projects (2 inches or less) consists of checking thickness regularly with a depth probe during placement and taking corrective action as necessary.

E. The Department applies Incentives/Disincentives for Gradation/Asphalt Content, In-Place Density and Longitudinal Joint Density. The Engineer computes Incentive/Disincentive for each lot.

1. Compute Incentive/Disincentive (Dollars/Ton) for Gradation, Asphalt Binder, and In-place Density according to Table 1.
2. Base the incentive/disincentive on Percent within Limit (PT) computation using Tables 2, 3, and 4.
3. Use lowest single value combined for gradation (each of the sieves) and asphalt binder content for calculating the gradation/asphalt binder content incentive/disincentive.
4. Use Table 4 to determine PT for in-place density.
5. Meet PT of 88 or greater for in-place density or the department does not pay incentives on gradation/asphalt binder content.

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6. For each lift, incentive for Joint Density is \$0.20 per linear foot of longitudinal joint when the average of all joint densities is within the density limits of Table 2 with no single determination less than 4% below in-place target density.
57. The following work is not eligible for incentive.
 - a. Work such as utility work, traffic signals, detours, ~~or~~ lane leveling, driveways, etc.;
 - b. Small projects with plan quantities of HMA less than 3000 tons.
68. The Department will reject the lot if the Percent within Limits is less than 60 percent.
7. Incentive for Joint Density is \$0.20 per foot when the average of all joint densities is within the density limits of Table 3 with no single determination less than 4% below in-place target density.

~~F. Smoothness Tests~~

1. ~~Determine acceptance and correct in accordance with Section 01452.~~

~~G. Cease production~~

1. ~~When any two out of three consecutive lots meet one of the following criteria:~~
 - a. ~~A net disincentive~~
 - b. ~~Air voids at N_{des} averaged for each lot are less than 2.5 or greater than 4.5 percent~~
2. ~~Before production continues, submit a corrective action plan to the Engineer indicating the changes in production procedures that will be implemented to correct the deficiencies.~~

~~H. The Department pays incentive/disincentive on the assessed quantities of HMA according to Table 1 Incentive/Disincentive for Gradation, Asphalt Binder Content and Density or Table 2 Incentive/Disincentive for VMA. Base the incentive/disincentive on Percent Within Limit (PT) computation using Tables 3, 4, and 5. Use lowest single value combined for gradation (each of the sieves) and asphalt binder content for calculating the gradation/asphalt binder content incentive/disincentive in Table 1.~~

1. ~~Meet PT of 88 or greater for density for eligibility for incentive in gradation/asphalt binder content and VMA. The Department does not pay incentive for gradation/asphalt binder content and VMA if the Contractor does not meet this condition.~~
2. ~~Incentives do not apply to the following:~~
 - a. ~~Small projects with plan quantities of HMA less than 3000 tons~~
 - b. ~~Work such as utility work, traffic signals, detours, or lane leveling.~~
3. ~~Incentives/Disincentives do not apply to material accepted on the basis of visual inspection per article 1.4.~~

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- ~~F.~~ The Department rejects the lot if the Percent ~~W~~within Limits (PT) for any individual measurement is less than 60 percent. ~~Disincentive for reject lots is \$15.00/Ton deduction.~~
- ~~J.~~ ~~To reduce over-testing of small quantity production days such as ramps or bridgework, the Engineer may, in concurrence with the Contractor, choose to combine production from several days to form a single lot.~~
- ~~1.~~ The Engineer may accept a reject lot based on an Engineering analysis.
- ~~a.~~ A ~~\$2150.00~~ per ton price reduction will be assessed.
- ~~b.~~ The lot will not be eligible for any incentive.
- ~~G.~~ The Engineer may elect to accept material on visual inspection for ~~work such as utility work, traffic signals, detours, lane leveling, driveways, etc., or small projects with plan quantities less than 3000 tons.~~ ~~or for work such as utility work, traffic signals, detours, lane leveling, etc.~~
- ~~1.~~ Lots accepted on visual inspection are not eligible for Incentive/Disincentive.
- ~~2.~~ The Engineer reserves the option of conducting any acceptance tests necessary to determine the material and workmanship meets the project requirements.
- ~~3.~~ Acceptance for density may be based on establishing and maintaining a roller pattern to obtain maximum density without over-stressing the pavement.

Table 1 Incentive/Disincentive for Gradation, Asphalt Binder Content and Density	
PT Based on Min. Four Samples	Incentive/Disincentive (Dollars/Ton)
> 99	1.500 91
96-99	1.000 74
92-95	0. 60 41
88-91	0. 00 7
84-87	-0.26
80-83	-0.60
76-79	-0.93
72-75	-1.27
68-71	-1.60
64-67	-1.93
60-63	-2.27
<60	Reject

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Table 2 Incentive/Disincentive for VMA	
PT Based on Minimum Three Samples	Incentive/Disincentive (Dollars/Ton)
>99	0.49
96-99	0.39
92-95	0.18
88-91	-0.03
84-87	-0.24
80-83	-0.44
76-79	-0.64
72-75	-0.85
68-71	-1.06
64-67	-1.27
60-63	-1.47
<60	Reject

Table 23 Upper and Lower Limit Determination	
Parameter	UL and LL
3/4^{3/4} inch sieve for 1 inch HMA 1/2^{1/2} inch sieve for 3/4 inch HMA 3/8^{3/8} inch sieve for 1/2^{1/2} -inch HMA No. 4 sieve for 3/8^{3/8} inch HMA	Target Value ± 6.0%
No. 8 sieve	Target Value ± 5.0%
No.50 sieve	Target Value ± 3.0%
No. 200 sieve	Target Value ± 2.0%
Asphalt Binder Content	Target Value ± 0.35%
VMA Production Range Target Range (Field) Target (Design)	Field Target Value ± 1.25% 12.5 % – 13.5 % for 1 inch 13.5 % – 14.5 % for 3/4 inch 14.5 % – 15.5 % for 1/2 inch 15.5 % – 16.5 % for 3/8 inch Modified as necessary to meet field target range
Density	Lower Limit: Target Value - 2.0% Upper Limit: Target Value + 3.0%

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<p>Table 34 Quality Index Values for Estimating Percent Within Limits</p>										
PU/PL	n=3	n=4	n=5	n=6	n=7	n=8	n=10	n=12	n=15	n=20
100	1.16	1.50	1.75	1.91	2.06	2.15	2.29	2.35	2.47	2.56
99	1.16	1.47	1.68	1.79	1.89	1.95	2.04	2.09	2.14	2.19
98	1.15	1.44	1.61	1.70	1.77	1.80	1.86	1.89	1.93	1.97
97	1.15	1.41	1.55	1.62	1.67	1.69	1.74	1.77	1.80	1.82
96	1.15	1.38	1.49	1.55	1.59	1.61	1.64	1.66	1.69	1.70
95	1.14	1.35	1.45	1.49	1.52	1.54	1.56	1.57	1.59	1.61
94	1.13	1.32	1.40	1.44	1.46	1.47	1.49	1.50	1.51	1.53
93	1.12	1.29	1.36	1.38	1.40	1.41	1.43	1.43	1.44	1.46
92	1.11	1.26	1.31	1.33	1.35	1.36	1.37	1.37	1.38	1.39
91	1.10	1.23	1.27	1.29	1.30	1.31	1.32	1.32	1.32	1.33
90	1.09	1.20	1.23	1.24	1.25	1.25	1.26	1.26	1.27	1.27
89	1.08	1.17	1.20	1.21	1.21	1.21	1.21	1.21	1.22	1.22
88	1.07	1.14	1.16	1.17	1.17	1.17	1.17	1.17	1.17	1.17
87	1.06	1.11	1.12	1.12	1.12	1.13	1.13	1.13	1.13	1.13
86	1.05	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
85	1.03	1.05	1.05	1.05	1.05	1.04	1.04	1.04	1.04	1.04
84	1.02	1.02	1.02	1.01	1.01	1.01	1.00	1.00	1.00	1.00
83	1.00	0.99	0.98	0.97	0.97	0.96	0.96	0.96	0.96	0.96
82	0.98	0.96	0.95	0.94	0.94	0.93	0.93	0.92	0.92	0.92
81	0.96	0.93	0.92	0.91	0.90	0.90	0.89	0.89	0.89	0.88
80	0.94	0.90	0.88	0.87	0.86	0.86	0.85	0.85	0.85	0.85
79	0.92	0.87	0.85	0.84	0.83	0.83	0.82	0.82	0.82	0.81
78	0.89	0.84	0.82	0.81	0.80	0.79	0.79	0.78	0.78	0.78
77	0.87	0.81	0.79	0.78	0.77	0.76	0.76	0.75	0.75	0.75
76	0.84	0.78	0.76	0.75	0.74	0.73	0.72	0.72	0.72	0.72
75	0.82	0.75	0.73	0.72	0.71	0.70	0.69	0.69	0.69	0.68
74	0.79	0.72	0.70	0.68	0.67	0.67	0.66	0.66	0.66	0.65
73	0.77	0.69	0.67	0.65	0.64	0.64	0.62	0.62	0.62	0.62
72	0.74	0.66	0.64	0.62	0.61	0.61	0.60	0.59	0.59	0.59
71	0.71	0.63	0.60	0.59	0.58	0.58	0.57	0.56	0.56	0.56
70	0.68	0.60	0.58	0.56	0.55	0.55	0.54	0.54	0.54	0.53
69	0.65	0.57	0.55	0.54	0.53	0.52	0.51	0.51	0.51	0.50
68	0.62	0.54	0.52	0.51	0.50	0.50	0.48	0.48	0.48	0.48
67	0.59	0.51	0.49	0.48	0.47	0.47	0.46	0.45	0.45	0.45
66	0.56	0.48	0.46	0.45	0.44	0.44	0.43	0.42	0.42	0.42
65	0.53	0.45	0.43	0.42	0.41	0.41	0.40	0.40	0.40	0.39
64	0.49	0.42	0.40	0.39	0.38	0.38	0.37	0.37	0.37	0.37
63	0.46	0.39	0.37	0.36	0.35	0.35	0.35	0.34	0.34	0.34
62	0.43	0.36	0.34	0.33	0.33	0.33	0.32	0.31	0.31	0.31
61	0.39	0.33	0.31	0.30	0.30	0.30	0.29	0.29	0.29	0.28
60	0.36	0.30	0.28	0.27	0.26	0.26	0.25	0.25	0.25	0.25
<60	≤ 0.35	≤ 0.29	≤ 0.27	≤ 0.26	≤ 0.25	≤ 0.25	≤ 0.24	≤ 0.24	≤ 0.24	≤ 0.24

Enter table in the appropriate “number of tests” sample size column and round down to the nearest value.

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Table 45
Definitions, Abbreviations, and Formulas for Acceptance

Term	Explanation
Target Value (TV)	The target values for gradation, <u>and</u> asphalt binder content and VMA are given in the Contractor's volumetric mix design. See <u>this Section</u> article 1.4, D , for density target values.
Average (AVE)	The sum of the lot's test results for a measured characteristic divided by the number of test results; the arithmetic mean.
<u>Sample</u> Standard Deviation (s)	The square root of the value formed by summing the squared difference between the individual test results of a measured characteristic and AVE, divided by the number of test results minus one. This statement does not limit the methods of calculations of s; other methods that obtain the same value may be used.
Upper Limit (UL)	The value above the TV of each measured characteristic that defines the upper limit of acceptable production. (Table <u>23</u>)
Lower Limit (LL)	The value below the TV of each measured characteristic that defines the lower limit of acceptable production (Table <u>23</u>)
Upper Quality Index (QU)	$QU = (UL - AVE)/s$
Lower Quality Index (QL)	$QL = (AVE - LL)/s$
Percentage of Lot Within UL (PU)	Determined by entering Table <u>34</u> with QU.
Percentage of Lot Within LL (PL)	Determined by entering Table <u>34</u> with QL.
Total Percentage of Lot (PL) Within UL and LL (PT)	$PT = (PU + PL) - 100$
Incentive/Disincentive	Determined by entering Table 1 and 2 with PT or PL.

All values for AVE, s, QU, and QL will be calculated to ~~a minimum of at least~~ four decimal place accuracy, which will be carried through all further calculations. Rounding to lower accuracy is not allowed.

~~1.5 LABORATORY CORRELATION~~

- ~~A. To be eligible for dispute resolution, perform the following:~~
- ~~1. Perform split sample, paired T testing with the Department based on project quality control testing using UDOT TTQP qualified lab.~~
 - ~~a. Perform split sample, paired T analysis on all mix acceptance tests related to volumetric properties and the following background testing:~~
 - ~~1) Maximum Specific Gravity of Mix, AASHTO T 209~~
 - ~~2) Bulk Specific Gravity of Mix, AASHTO T 166~~
 - ~~3) Bulk Specific Gravity of Coarse Aggregates, AASHTO T 85~~
 - ~~b. Continue until attaining successful Paired T test results, meeting $\alpha = 0.05$, for a minimum of two consecutive production days. (UDOT Materials Manual of Instruction Part 8: Chapter 4, Appendix C)~~
- ~~B. Submit a detailed report showing tabular summaries of daily test data, paired T calculations and any corrections made to account for failed comparisons.~~
- ~~C. Submit summary prior to submitting engineering analysis for dispute resolution.~~

1.6 DISPUTE RESOLUTION

- A. When disputing the validity of the Department's acceptance tests, follow requirements of Section 01456: Materials Dispute Resolution, submit an engineering analysis within one week of receipt of test results. Engineering Analyses will be accepted if based on test results performed by an AASHTO accredited lab that has performed a split sample process with the Department.
- ~~B. At a minimum, include the following items in the engineering analysis:~~
- ~~1. Data supporting the Contractor's test results. Data must be based on project quality control testing.~~
 - ~~a. Split sample testing performed within the applicable contract~~
 - ~~b. Test data disputed along with:~~
 - ~~1) Maximum Specific Gravity of Mix, AASHTO T 209~~
 - ~~2) Bulk Specific Gravity of Mix, AASHTO T 166~~
 - ~~3) Bulk Specific Gravity of Coarse Aggregates, AASHTO T 85~~
 - ~~c. Successful Laboratory Correlation information, Article 1.5~~
 - ~~2. Procedures or issues leading to disputed acceptance test results.~~

3. ~~Determination of volumetric, durability and long-term structural properties from one or more of the following tests:~~
 - a. ~~Hamburg Wheel Track Testing of Compacted Bituminous Mixtures; AASHTO T 324~~
 - b. ~~Resistance of Compacted Bituminous Mixture to Moisture Damage; UDOT Materials Manual of Instruction Part 8-957.~~
 - c. ~~Standard Test Method for Determining Rutting Susceptibility Using the Pavement Analyzer; UDOT Materials Manual of Instruction Part 8-958.~~
 - d. ~~Dynamic Modulus Evaluation, AASHTO TP 62~~
 - e. ~~PG Asphalt Binder Tests~~
 - f. ~~AASHTO T 312~~
 4. ~~Incentive/Disincentive calculations based on Contractor and Department test values.~~
 5. ~~Recommendations for price adjustment based on expected long-term performance.~~
- C. ~~When paving plans indicate that a reject lot will be covered within 48 hours, the Department immediately reviews the analysis to identify possible discrepancies that can be resolved through validation testing based on the following:~~
1. ~~Department performs repeat testing on remaining material from original Department test.~~
 2. ~~Department personnel perform repeat testing in the presence of Contractor representative within a 24-hour time period.~~
 3. ~~Use results to validate or invalidate original Department result. Validation test results may not be used in lieu of acceptance results.~~
 4. ~~Base validation on results within two standard deviations (project acceptance samples) of original acceptance result. Remove invalidated test results from acceptance lot and reevaluate lot based on reduced sample size.~~
 5. ~~The Engineer reviews the results and notifies the Contractor of any findings that affect the reject status of the lot along with the Department's position on whether the lot is to be removed or may remain in place at the \$15.00/ton deduction for Reject Lot.~~
- D. ~~Within three working days of receipt, the Resident Engineer, Region Materials Engineer, and Region Construction Engineer review the analysis and notify the Contractor in writing of acceptance or rejection. Notification of rejection includes the following:~~
1. ~~Engineering basis for rejecting the Contractor's analysis, including specific points of objection.~~
 2. ~~Department data and analysis to justify Department position.~~
 3. ~~Time frame for removal of material or pay adjustment to be applied to the lot.~~

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~~E. When the Department concludes the engineering analysis has merit, the Department, in conjunction with the Contractor, immediately begins a review of the acceptance test results. The review includes, but is not be limited, to the following:~~

- ~~1. Independent Assurance review of all equipment and procedures and methods used for sampling, splitting, and testing.~~
- ~~2. A review of the Department and Contractor's raw test data and calculations for documentation or calculation errors.~~
- ~~3. Production and testing of additional correlation samples.~~
- ~~4. Cross-witnessing of test procedures by Contractor Quality Control and Department personnel.~~
- ~~5. Distribution of any other pertinent information.~~
- ~~6. Discussion of other possible means for variation.~~

~~Note: If engineering analysis is initiated due to failure of statistical methods to verify Contractor testing and there is no net difference between incentive/disincentive based on Contractor or Department testing, the Engineer may verify contractor test values based on engineering analysis.~~

~~F. Do not continue production without concurrence from the Engineer or until differences in the test results are resolved.~~

~~G. If errors in testing or reporting are discovered, the Department corrects the applicable test results and re-applies the acceptance/pay adjustment procedures.~~

- ~~1. If errors are identified that cannot be corrected and the quality of the lot is in question, the Department may choose to evaluate the lot using the Hamburg Wheel Tracker (AASHTO T 324), or the Asphalt Pavement Analyzer (UDOT Materials Manual of Instruction Part 8-958: Standard Test Method for Determining Rutting Susceptibility using the Pavement Analyzer).~~

~~a. Use 5 stratified random samples cut from the roadway~~

~~b. The Region Materials Engineer and Resident Engineer decide, in conjunction with the Contractor, the status of the lot and associated pay adjustment, based on the following:~~

~~1) Fatigue Life~~

~~2) Stripping Potential~~

~~3) Rutting Potential~~

~~4) Expected Pavement Performance Period vs. Design Life~~

- ~~2. Errors that are identified within the Department's testing result in a review of the Contractor's schedule and if appropriate, make adjustments to the CPM.~~

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- ~~H. If errors in testing cannot be identified, select an Independent Third Party (Agreed upon by the Department and the Contractor) to witness sample splitting and testing by both the Contractor and the Department. The Independent Third Party identifies/produces additional material for split-sample testing.~~
- ~~I. If testing errors are identified by the Third Party, the Department makes appropriate adjustments to the acceptance test results and re-applies the acceptance/pay adjustment procedures.~~
- ~~J. The party responsible for the identified error pays for the services of the Independent Third Party.~~
- ~~K. If no errors are identified, the Department evaluates the lot using the original testing results.~~

PART 2 PRODUCTS

2.1 ASPHALT BINDER

- A. Refer to Section 02742S, Project Specific Surfacing Requirements.
- B. Asphalt Material as per Section 02745.
- ~~C. Adhere to UDOT Minimum Sampling and Testing Guide Quality Management Plan 509: Asphalt Binder Quality Management System sampling, testing and handling of Asphalt Binder.~~

2.2 AGGREGATE

- ~~A. Refer to the UDOT Minimum Sampling and Testing Guide for testing frequencies.~~
- ~~BA.~~ Crusher processed virgin aggregate material consisting of crushed stone, gravel, or slag.
- ~~Conform to Section 02969 for recycled mixes of~~
- ~~1. Limit RAP to 30 percent by total weight in the hot mix.~~
- ~~CB.~~ Meet Use the following requirements, including Table 56, to determine the suitability of the aggregate.
1. Coarse aggregates:
 - a. Retained on No. 4 sieve.
 2. Fine aggregates:

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- a. Clean, hard grained, and angular.
- b. Passing the No. 4 sieve.

Table 56			
Aggregate Properties - HMA			
Test Method	Test No.	Category 1	Category 2
One Fractured Face	AASHTO TP 61	95% min.	85% min. (1 inch and 3/4 inch), and 90% min. (1/2 inch and 3/8 inch)
Two Fractured Face	AASHTO TP 61	90% min.	80% min. (1 inch and 3/4 inch), and 90% min. (1/2 inch and 3/8 inch)
Fine Aggregate Angularity	AASHTO T 304	45 min.	45 min.
Flakiness Index	UDOT MOI 933 (Based on 3/8 inch sieve and above)	17% max.	17% max.
L.A. Wear	AASHTO T 96	35% max.	40% max.
Sand Equivalent	AASHTO T 176 (Pre-wet method)	60 min.	45 min.
Plasticity Index	AASHTO T 89 and T 90	0	0
Unit Weight	AASHTO T 19	min. 75 lb/cu. ft.	min. 75 lb/cu. ft.
Soundness (sodium sulfate)	AASHTO T 104	16 % max. loss with five cycles	16 % max. loss with five cycles
Clay Lumps and Friable Particles	AASHTO T 112	2% max	2% max.
Natural Fines	N/A	0%	10% max.
Category 1: National Highway System and Truck Routes - Table 944.			
Category 2: All Other Routes			

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D. Meet gradation requirements in Table ~~67~~. ~~AASHTO T 27/T 11~~

Table 67 Aggregate Gradations (Percent Passing by Dry Weight of Aggregate)					
Sieve Size		1 inch (SHRP 25 mm)	3/4 inch (SHRP 19 mm)	1/2 inch (SHRP 12.5 mm)	3/8 inch (SHRP 9.5 mm)
Control Sieves	1-1/2 1/2 inch	100.0	-	-	-
	1 inch	90.0 - 100.0	100.0	-	-
	3/4 3/4 inch	<90	90.0 - 100.0	100.0	-
	1/2 1/2 inch	-	<90	90.0 - 100.0	100.0
	3/8 3/8 inch	-	-	<90	90.0 - 100.0
	No. 4	-	-	-	< 90
	No. 8	19.0 - 45.0	23.0 - 49.0	28.0 - 58.0	32.0 - 67.0
	No. 200	1.0 - 7.0	2.0 - 8.0	2.0 - 10.0	2.0 - 10.0

2.3 HYDRATED LIME

A. Meet the requirements of Section 02746.

2.4 RECLAIMED ASPHALT PAVEMENT (OPTIONAL)

A. When ~~Limit~~ reclaimed asphalt pavement (RAP) is limited to ~~30~~15 percent by total weight of ~~in the hot mix~~, no asphalt binder grade adjustment is necessary.

1. ~~RAP aggregate is required to meet Table 5 with exception of Sand Equivalent AASHTO T 176.~~
B. When RAP content is between 15 to 25 percent of the total weight of the hot mix, adjust asphalt binder grade according to AASHTO M 323.
1. Select one grade softer than the grade specified. Do not select any grades lower than PG XX-34.

C. When RAP content exceeds 25 percent, adjust asphalt binder grade according to AASHTO M 323 Appendix A.
1. Obtain Engineers approval to exceed 25 percent.
2. Use RAP from a single source.
3. Provide test reports indicating that the PG grade of the recovered asphalt binder is consistent throughout the stockpile.
4. Limit RAP to 30 percent of the total weight of the hot mix.

D. RAP aggregate is required to meet Table 5 with exception of Sand Equivalent AASHTO T 176.

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2.54 VOLUMETRIC DESIGN

- A. ~~Perform~~Comply with all requirements Superpave Volumetric Mix Design in accordance with UDOT Materials Manual of Instruction~~MOI for Superpave Volumetric Mix Design according to UDOT Materials Manual of Instruction Part 8-960~~4: Guidelines for Superpave Volumetric Mix Design and the following:
- ~~1. Meet the requirements of Table 8 and Table 9.~~
 - ~~2. Use a laboratory qualified by UDOT Central Materials in the use of the Superpave Gyratory Compactor.~~
 - ~~3. Use a Superpave Gyratory Compactor approved in accordance with UDOT Materials Manual of Instruction Part 8-961: Guidelines for Superpave Gyratory Compactor Protocol.~~
 - ~~4. Meet all volumetric mix design requirements for the selected target gradation.~~
- B. ~~Submit the Volumetric Mix Design data for verification at least 10 working days before beginning paving. Do not begin paving until verification is complete.~~
- ~~1. Include all information regarding selection of design aggregate structure showing the target values of percent passing on all sieves listed in Table 3 and Table 7, and the design asphalt binder content.~~
 - ~~2. Provide information that aggregate proposed for use meet the requirements of Table 6.~~
 - ~~3. Supply QC data for target job mix gradation selection. Use those target values for price adjustments.~~
 - ~~4. After the design is complete, run four sets of two Gyratory specimens at the design asphalt binder content to verify the optimum asphalt and all other design requirements.~~
- C. ~~Moisture Susceptibility~~
- ~~1. Incorporate hydrated lime into all volumetric designs in accordance with Section 02746.~~
 - ~~2. Comply with the Table 7 and Table 8. Use 1 percent, minimum, for Method A and 1½ percent, minimum for Method B (Section 02746).~~
- D. ~~Designate asphalt binder supplier.~~
- E. ~~Use gyratory mixing and compaction temperatures supplied by the Engineer.~~
- ~~F~~B. The Department Region Materials Lab verifies the Volumetric Mix Design. ~~UDOT Materials Manual of Instruction Part 8-960: Guidelines for Superpave Volumetric Mix Design~~UDOT Materials Manual of Instruction~~MOI -960.~~
- ~~1. Do not begin paving until verification is complete. For small projects with plan quantities of HMA less than 3000 tons, or for work such as utility work, traffic signals, detours, or lane leveling, the Region Materials Engineer may~~

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~~accept the Volumetric Mix Design from data submitted with the proposed mix design or from a previous mix design. The Region Materials Engineer reserves the right to verify any mix design submitted.~~

~~G. Comply with the following requirements for Superpave volumetric mix design:~~

Table 78 Volumetric Design Gyration				
20 Years Design ESALS (Million)	Compaction Parameters			Voids Filled with Asphalt (VFA) (%)
	N _{initial} /% of G _{mm} *	N _{design} /% of G _{mm} *	N _{max} /% of G _{mm} *	
0.3	6/≤ 91.5	50/ ≥ 96.5	75/≤ 98	70 - 80 **
0.3 to <3	7/≤ 90.5	75/ ≥ 96.5	115/≤ 98	70 - 80
3 to < 30	8/≤ 89	100/ ≥ 96.5	160/≤ 98	70 - 80
≥ 30	9/≤ 89	125/ ≥ 96.5	205/≤ 98	70 - 80

* G_{mm}: Maximum specific gravity of mix. (Rice Method)

** 67 percent specified lower limit VFA for ~~1~~-inch nominal maximum size mixture.

Table 8109 Volumetric Design Requirements	
HMA design mixing and compaction temperatures	Provided by the Engineer
Dust Proportion Range	0.6 - 1.40
Voids in Mineral Aggregate (VMA) at N _{design} AASHTO R 35.9.2, using G _{sb} at SSD. Equation based on percent of total mix.	12.5 % - 13.5 % for 1 inch 13.5 % - 14.5 % for ¾ inch 14.5 % - 15.5 % for ½ inch 15.5 % - 16.5 % for 3/8 inch Select Design Target such that Field Performance meets Field Target requirements (Submit calculations or documentation to substantiate)
Hamburg Wheel Tracker UDOT AASHTO T-32 MOI 9904	Category 1 Roads: Maximum 10 mm impression at 20,000 passes cycles. Category 2 Roads: Maximum 10 mm impression at 10,000 passes

~~H. Prepare and submit two sets (five samples each) of ignition oven calibration samples.~~

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- ~~1. Department uses these samples to determine the correction factors for the Region and Field lab ignition oven.~~
- ~~2. Submit samples a minimum of three working days prior to paving.~~

~~2.5 CONTRACTOR INITIATED CHANGES IN MIX DESIGN~~

- ~~A. Submit all requests, in writing to Engineer, at least 12 hours prior to incorporating changes into production.~~
- ~~B. Submit a field volumetric mix design for all target changes with the exception of the initial establishment of VMA field target. Field target for VMA may be adjusted once, without submission of new mix design, after production of first paving lot.~~
 - ~~1. Include documentation supporting correlation between suggested target changes and mix design volumetric requirements. Department acceptance and/or Contractor QC testing data is acceptable.~~
 - ~~2. Field volumetric mix design verification consists of three sets of two gyratory specimens run at the new target gradation and/or asphalt binder content. The Department's previous acceptance tests are acceptable for field verification.~~
 - ~~3. If the field volumetric mix design meets the volumetric requirements, the Engineer, in consultation with the Region Materials Engineer, provides written concurrence of the verified field volumetric mix design.~~
 - ~~4. If the field volumetric mix verification does not meet the volumetric requirements, submit a new laboratory volumetric mix design from a laboratory qualified by UDOT Central Materials. Allow at least four working days for verification.~~
 - ~~5. The Department performs up to two volumetric mix design verifications at no cost to the Contractor. The Department charges \$3000 for each additional laboratory and/or field verification required, including all laboratory or field volumetric mix design verifications required due to contractor initiated target changes.~~
- ~~C. Submit a new laboratory volumetric mix design if changes occur in the aggregate source, asphalt binder source or grade.~~
- ~~D. Do not make changes to production mix until request is reviewed and verified.~~

PART 3 EXECUTION

~~3.1 ADDING HYDRATED LIME~~

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~~A. Method A, Lime Slurry; or Method B, Lime Slurry Marination: Refer to Section 02746.~~

3.21 HMA

A. Dry aggregate to an average moisture content of not more than 0.2 percent by weight.

1. ~~May be V~~verified by AASHTO T 255.

2. Adjust burners to avoid damage or soot contamination of the aggregate.

~~B. Treat aggregate with hydrated lime in accordance with the requirements of 02746.~~

1. ~~When using Method A, insure lime slurry equipment is operating at all times.~~

~~a. Cease production if hydrated lime slurry treatment is interrupted.~~

~~b. Engineer may require marination of the aggregate/hydrated lime mixture in the stockpile, Method B, if production continues without hydrated lime slurry treatment.~~

~~BC.~~ Coat with asphalt binder 100 percent of the particles passing and 98 percent of the particles retained on the No. 4 sieve.

1. ~~May be V~~verified by AASHTO T 195.

2. Discontinue operation and make necessary corrections if material is not properly coated.

~~ED.~~ Maintain temperature of the HMA between identified limits for mixing and compaction, as defined on Volumetric Mix Design Verification Letter.

1. Department rejects materials heated over the identified limits.

2. Remove all material rejected by the Department for overheating.

3.23 HMA PLANT

A. Provide:

1. Positive means to determine the moisture content of aggregate.

2. Positive means to sample all material components.

3. Sensors to measure the temperature of the HMA at discharge.

4. The ability to maintain discharge temperature of the mix in accordance with the mix design.

B. ~~Provide A~~asphalt ~~Binder-binder Storage-storage Tanktanks that:~~

1. ~~Provide e~~Are calibrated tanks so the quantity of material remaining in the tank can be determined at any time.

2. Provide a positive means of sampling the asphalt binder from the tanks.

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3.3 CEASE PRODUCTION

- A. When any two out of three consecutive lots meet one of the following criteria:
 - 1. A net disincentive
 - 2. Air voids at N_{des} averaged for each lot are less than 2.5 or greater than 4.5 percent
 - 3. VMA at N_{des} averaged for each lot are not within Target Value ± 1.25 percent
- B. Before production continues, submit a corrective action plan to the Engineer indicating the changes in production procedures that will be implemented to correct the deficiencies

3.4 CONTRACTOR INITIATED CHANGES IN MIX DESIGN

- A. Changes in job mix gradation:
 - 1. Submit a written request for a change in a job-mix gradation in accordance with this Section, article 1.3, Submittals (This ref will change when required articles are added).

3.5 LABORATORY CORRELATION

- A. Perform split-sample, Paired t -testing with the Department based on project quality control testing using UDOT LQP qualified lab.
 - 1. Perform split-sample, Paired t analysis on all mix acceptance tests and tests related to volumetric properties.
 - 2. Perform Paired t analysis as defined in the Materials Manual of Instruction, Appendix C.
 - 3. Continue Paired t -testing until at least two consecutive production days meet $\alpha = 0.05$ for a two tailed distribution.Meet $\alpha = 0.05$ for a minimum of at least two consecutive production days.
Perform Paired t analysis as defined Materials Manual of Instruction Appendix C.

3.6 SURFACE PREPARATION

- A. Locate, reference, and protect all utility covers, monuments, curb and gutter, and other components affected by the paving operations.
- B. Remove all moisture, dirt, sand, leaves, and other objectionable material from the prepared surface before placing the mix.
- C. Complete spot leveling ~~48 hours~~ before placing pavement courses.

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1. Place, spread, and compact leveling mix on portions of the existing surface.
 2. Fill and compact any localized potholes more than 1 inch deep.
 3. Allow compacted mix to cool sufficiently (below 150 degrees F) to provide a stable structural platform before placing additional lifts of HMA.
- D. Allow sufficient cure time for prime coat/tack coat ~~prior to~~before placing HMA. Refer to Section 02748.

3.75 SURFACE PLACEMENT

- A. When full-width or ~~e~~Echelon paving is impractical and more than one pass is required, provide a 3:1 (horizontal to vertical) sloped edge adjacent to the next lane to be paved.
- B. Adjust the production of the mixing plant and material delivery until a steady paver speed is maintained.
- C. Offset longitudinal joints 6 to 12 inches in succeeding courses.
 1. Place top course joint within one foot of the centerline or lane line.
 2. If the previous pass has cooled below 175 degrees F, tack the longitudinal edge before placing the adjacent pass.
- D. Offset transverse construction joints at least 6 ft longitudinally. ~~to avoid a vertical joint through more than one course.~~
- E. Do not allow construction vehicles, general traffic, or rollers to pass over the uncompacted end or edge of freshly placed mix until the mat temperature drops to a point where damage or differential compaction will not occur.
- F. Taper the end of a course subjected to traffic at approximately 50:1 (horizontal to vertical).
 1. ~~Remove the portion of the pass that contains the tapered end before placing fresh mix. Make a transverse joint by saw or wheel cutting, and removing the portion of the pass that contains the tapered end.~~
 2. Tack the contact surfaces before fresh mix is placed against the compacted mix.
- G. Use a motor grader, spreader box, or other approved spreading methods for projects under 180 yd², irregular areas, or for miscellaneous construction such as detours, sidewalks, and leveling courses.

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3.86 COMPACTION

- A. ~~In addition to normal rolling, Use~~ a small compactor or vibratory roller ~~in addition to normal rolling~~ at structures.
- B. Operate in a transverse direction next to the back wall and approach slab.

3.93.7 LIMITATIONS

- A. Do not place ~~HMA~~ on frozen base or during adverse climatic conditions such as precipitation or when roadway surface is icy or wet ~~or subbase~~.
- B. Use a ~~UDOT approved~~ release agent acceptable to the Engineer for all equipment and hand tools used to mix, haul, and place the HMA. ~~Select from the Performance Data Products Listing (PDPL) maintained by the UDOT Research Division.~~
- ~~C. Do not place HMA during adverse climatic conditions, such as precipitation, or when roadway surface is icy or wet.~~
- ~~DC.~~ Place ~~HMA from between~~ April 15, and October 15, and when the air temperature in the shade and the roadway surface temperature are above 50 degrees F.
 - 1. The Department determines, and provides written approval, if it is ~~feasible~~ acceptable to place ~~HMA~~ outside the above limits.
~~Obtain written approval from the Engineer prior to before paving from October 15, to April 15.~~

~~3.8 CONTRACTOR QUALITY CONTROL~~

- ~~A. General~~
 - ~~1. Reference the following standards for qualification, control, and guidelines:~~
 - ~~a. ASTM D 3666~~
 - ~~b. ASTM D 4561~~
 - ~~c. ASTM D 5506~~
 - ~~2. Include the following tests in ASTM D 5506, Part 2, "Referenced Documents," for the following:~~
 - ~~a. AASHTO T 308~~
 - ~~b. AASHTO T 312, PP 28~~
 - ~~c. ASTM E 1274~~
 - ~~3. Establish and maintain a quality control system providing assurance that materials and completed construction conform to Contract requirements.~~
 - ~~4. Identify the Quality Control Manager by name. The Quality Control Manager implements and maintains the Quality Control Plan.~~

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5. ~~Provide the Engineer a certification stating that all the testing equipment to be used is properly calibrated and meets the specifications applicable for the specified test procedures. Provide evidence that Technicians are UDOT TTQP qualified. The Engineer may require the Contractor's technician to perform testing of samples to demonstrate an acceptable level of performance.~~

~~B. Quality Control Plan (QCP)~~

1. ~~Provide and maintain a Quality Control Plan covering all personnel, equipment, supplies, and facilities necessary to obtain samples, perform and document tests, and otherwise provide a quality product.~~
2. ~~Submit the written QCP to the Engineer at least 10 days before beginning operations, or at the Preconstruction Conference.~~
3. ~~The Department makes no partial payments for materials that are subject to specific quality control requirements without a QCP.~~
4. ~~The Contractor or independent organization may operate the QCP. However, the Contractor is responsible for the QCP's administration, including compliance with the QCP and any modifications.~~
5. ~~Address the following minimum items:~~
 - a. ~~Quality control organization chart and area of responsibility and authority of each individual.~~
 - b. ~~Names and qualifications of personnel as required by this Article.~~
 - c. ~~Provide a description of outside organizations and their services (such as testing laboratories) if employed.~~
 - d. ~~Tests required to be performed, the frequency of testing, sampling locations, and location of the testing facilities.~~
 - e. ~~Documentation of test procedures verifying that tests are conducted in accordance with the testing plan, and that proper corrective actions are taken when required.~~
 - f. ~~Procedures for verifying that testing equipment is available, complies with specified standards, and is calibrated against certified standards.~~
 - g. ~~Procedures for verifying that tests are conducted in accordance with the appropriate ASTM and AASHTO standards.~~
 - h. ~~Procedures for submitting test results to the Engineer daily.~~
6. ~~QCP elements: address all elements that affect the quality of the HMA including:~~
 - a. ~~Mix Design~~
 - b. ~~Aggregate Grading~~
 - c. ~~Quality of Materials~~
 - d. ~~Stockpile Management~~
 - e. ~~Proportioning~~
 - f. ~~Mixing~~
 - g. ~~Placing and Finishing~~
 - h. ~~Sampling and Testing Procedures~~

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- i. ~~_____~~ Joints
- j. ~~_____~~ Compaction
- k. ~~_____~~ Surface smoothness

~~C. _____~~ Quality Control Organization

- 1. ~~_____~~ Implement the QCP by:
 - a. ~~_____~~ Establishing a separate Quality Control Organization.
 - b. ~~_____~~ Developing an organization chart to show all quality control personnel and how these personnel integrate with other management, production, and construction functions and personnel.
- 2. ~~_____~~ Identify all quality control staff on the organization chart by name and function, and indicate the total staff required to implement all elements of the quality control programs, including inspection and testing functions for different items of work.
- 3. ~~_____~~ If an outside organization or laboratory is used to implement all or part of the QCP, the personnel assigned are subject to the qualification requirements of this Section. Indicate on the organization chart which personnel are contractor employees and which are provided by an outside organization.

~~D. _____~~ Quality Control Organization Personnel Requirements

- 1. ~~_____~~ As outlined in ASTM D 3666, Part 7, with the following modifications:
Quality Control Manager:
 - a. ~~_____~~ Institutes any actions necessary to successfully operate the QCP in compliance with specifications.
 - b. ~~_____~~ Reports directly to a responsible officer in the Contractor's organization.
 - c. ~~_____~~ May supervise the QCP on more than one project provided that the Quality Control Manager can be at the job site within one hour after being notified of a problem.
- 2. ~~_____~~ Qualification of Personnel. As outlined in ASTM D 3666 with the following changes:
 - a. ~~_____~~ Provide a sufficient number of quality control technicians to adequately implement the QCP. These personnel will be either engineers or engineering technicians qualified by UDOT TTQP.
- 3. ~~_____~~ Quality Control Technicians:
 - a. ~~_____~~ Report directly to the Quality Control Manager.
 - b. ~~_____~~ Inspect all plant equipment used in proportioning and mixing to verify proper calibration and operating condition.
 - c. ~~_____~~ Perform quality control tests necessary to adjust and control mix proportioning in accordance with the job mix formula.
 - d. ~~_____~~ Inspect all equipment used in placing, finishing, and compaction to verify proper operating condition.

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- e. ~~Inspect all construction operations to verify conformance with the specifications.~~
- f. ~~Perform all quality control testing as required within this article.~~
- g. ~~Detail the criteria to be used in initiating correction of unsatisfactory production processes and construction practices.~~

E. ~~Quality Control Testing Laboratory~~

1. ~~Reference ASTM D 4561 with the following additions:~~

- a. ~~Provide a fully equipped asphalt laboratory located within 30 minutes travel time of the plant or job site.~~
- b. ~~Keep laboratory facilities clean and all equipment maintained in proper working condition.~~
- c. ~~Permit the Engineer unrestricted access to inspect the quality control testing laboratory facility and witness quality control activities. The Department advises in writing of any noted deficiencies concerning the laboratory facility, equipment, supplies or testing personnel and procedures.~~
- d. ~~Suspend work when test results indicate materials are out of specification tolerances. Resume only when the deficiencies are corrected.~~

~~1) Perform quality audits under this standard.~~

~~2) Refer to UDOT Quality Assurance Manual.~~

2. ~~Sampling:~~

- a. ~~Use a statistically based procedure of random sampling, independent of UDOT's random acceptance sampling determinations. (UDOT Materials Manual of Instruction Part 8-981: Random Sampling)~~
- b. ~~The Engineer has the right to witness all sampling.~~

3. ~~Noncompliance:~~

- a. ~~When quality control activities do not comply with either the Quality Control Program or the Contract provisions, or failure to properly operate and maintain an effective Quality Control Program, the Engineer may:~~
 - ~~1) Order replacement of ineffective or unqualified personnel.~~
 - ~~2) Carry out the functions and operation of the approved Quality Control Program.~~
 - ~~3) Deduct costs incurred by the Department to operate the program or otherwise remedy the noncompliance from the total amount due the Contractor.~~

F. ~~Quality Control Testing~~

- 1. ~~Perform all quality control tests necessary to control the production and construction processes applicable to these specifications and listed in the QCP.~~

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2. ~~Establish a testing program to control as a minimum: asphalt binder content, aggregate gradation, VMA, temperatures, aggregate moisture, field compaction, and surface smoothness.~~
3. ~~Monitoring: The Department reserves the right to monitor any QC testing.~~
4. ~~Follow the requirements of Table 10, and conduct any additional testing to control the process.~~

Table 10 Quality Control Testing for HMA	
Testing Method/ Acceptance Documentation	Testing Frequency
AASHTO T 308 Asphalt binder content: by the ignition method	Minimum 4 tests per lot **
AASHTO T 30 Gradation: Mechanical analysis of the remains of the Ignition test.	Minimum 4 tests per lot
AASHTO T 255 Moisture content: of aggregate used in production by drying	Minimum One test per lot
Temperature for: dryer, bitumen in the storage tank, mixture at the plant, and mixture at the job site.	Record at least four times per lot
ASTM D 2950 In-place Density Monitoring Conduct all testing necessary to meet density requirements.	Minimum 10 density determinations per lot
AASHTO T 312, R 35 Field Gyratory Specimens Verify mix design parameters meet Job mix requirements, and adjust mix as needed to meet parameters. Mold field gyratory specimens at mix design temperatures determined by the Engineer.	Minimum of one determination (two Gyratory specimens each) of VMA and Air Voids for each lot.

**** A lot is defined in article 1.4**

G. ~~Control Charts~~

1. ~~Maintain daily linear control charts both for mean and range. Include in charts aggregate gradation, asphalt binder content, stockpile gradation, VMA, density and in place air voids.~~
2. ~~Post control charts daily in a location satisfactory to the Engineer. As a minimum, identify:~~
 - a. ~~Project number~~
 - b. ~~Contract item number~~

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- e. ~~Test number~~
- d. ~~Each test parameter~~
- e. ~~Test results~~

- 3. ~~Use the control charts as part of a process control system for identifying potential problems and assignable causes before they occur. If the projected data during production indicates a problem and no corrective action is taken, the Engineer may suspend production or acceptance of the material.~~

H. ~~Quality Control Reports~~

- 1. ~~Maintain records and submit daily reports of quality control activities.~~

Table 11
National Highway System and Truck Routes
Category 1

Interstate Routes	Beginning	Ending
1-15	Arizona State Line	Idaho State Line
1-70	Jet I-70—Cove Fort	Colorado State Line
1-80	Nevada State Line	Wyoming State Line
1-84	Idaho State Line	Jet I-80—Coalville
1-215	Jet I-80—Parleys Canyon	Jet I-15—North Salt Lake
US Routes		
US-6	Nevada State Line	Jet US-50—Delta
US-6	Jet I-15—Spanish Fork	Jet I-70—Green River
US-40	Jet I-80—Park City	Colorado State Line
US-50	Jet US-6—Delta	Jet I-15—Holden
US-89	Arizona State Line	Jet I-70—Sevier
US-89	Jet I-70—Salina	Jet SR-28—Gunnison
US-89	Jet US-6—Spanish Fork	Jet SR-73—Lehi
US-89	SR-71—Draper	Jet SR-269—5 th and 6 th South
US-89	Jet I-15—Farmington	Jet I-80—Uintah
US-89	Jet I-84—Uintah	Jet SR-134—North Ogden
US-89	Jet US-91—Logan	Idaho State Line
US-91	Jet I-15—Brigham City	Jet US-89—Logan
US-189	Jet I-15—South Provo	Jet US-40—Heber City
US-191	Arizona State Line	Jet I-70—Thompson
US-666	Jet US-191—Monticello	Colorado State Line

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State Routes	Beginning	Ending
SR-9—Zions Park		
SR-10—Castle Valley	Jet I-70—Fremont Jet	Jet US-6—Price
SR-12—Bryce Canyon	Jet US-89—Panguitch	Jet SR-63—Bryce Canyon
SR-26—Riverdale Road	Jet I-15—Exit 342	Jet US-89—Ogden
SR-28—Levan Desert	Jet US-89—Gunnison	Jet I-15—South Nephi
SR-31—Huntington	Mile Post 33	Mile Post 49
SR-36—Tooele Access	Jet entrance—Tooele Army Depot	Jet I-80—Tooele Interchange
SR-39—20th and 21st Ogden	Jet I-15—Exit 344	Jet SR-203—Harrison Blvd
SR-52—8th North, Orem	Jet I-15—Orem	Jet US-189—Olmstead Jet
SR-57—Orangeville Bypass	Jet SR-10—Hunter Power Plant	Entrance—Wilberg Coal Mine
SR-71—7th and 9th East Street, Salt Lake City	Jet SR-209—90th South Street	Jet SR-186—4th South Street
SR-73—Lehi Connection	Jet I-15—South Lehi	Jet US-89—South Lehi
SR-79—12th Street Ogden	Jet I-15—Exit 347	Jet SR-203—Harrison Blvd.
SR-96—Scofield Access	Mile Post 3	Mile Post 4
SR-111—Bacchus Highway	Jet SR-48—Bingham Highway	Jet SR-201—21st South Expressway
SR-134—2700 North	Jet I-15—North Ogden, Exit 352	Jet US-89—North Ogden
SR-152—Van Winkle Expressway	Jet SR-71—9th East Street	Jet I-215—East (Exit 8)
SR-154—Bangerter Highway	Jet I-15—Draper	Jet I-80—Salt Lake Intl Airport
SR-171—33rd and 35th South, Salt Lake City	Jet SR-172—56th West Street	Jet I-215—East, Exit 3
SR-172—56th West Street Salt Lake City	Jet 6200 South—Kearns	Jet I-80—International Center
SR-186 Foothill Blvd	Jet SR-71—7th East Street, SLC	Jet I-215—East (Exit 1)
SR-190—Big Cottonwood	Jet I-215—East, Exit 7, SLC	Jet SR-210—Little Cottonwood
SR-201—21st South Expressway	Jet I-80—Lake Point	Jet I-15—South Salt Lake
SR-203—Harrison Blvd	Jet US-89—South Ogden	Jet SR-39—12th Street

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State Routes	Beginning	Ending
SR-209-90th & 94th South	Jct SR-68-Redwood Road (SLC)	Jct SR-210-Little Cottonwood
SR-210-Little Cottonwood	Jct SR-190-Big Cottonwood	Jct SR-209-90th and 96th South
SR-264-Skyline Mine Road	Mile Post 12	Mile Post 15
SR-265-University Parkway	Jct I-15-Exit 272	Jct I-215 East, Exit 5
SR-266-45th & 47th South Taylorsville	Jct I-215-West, Exit 15	Jct I-215-East, Exit 5
SR-269-5th & 6th South Salt Lake City	Jct I-215, Exit 310	Jct SR-71-7th East Street

Table 9

Category 1 Roads

<u>Route</u>	<u>Beginning</u>	<u>Ending</u>
<u>1-15</u>	<u>Arizona State Line</u>	<u>Idaho State Line</u>
<u>1-70</u>	<u>Jct I-70 - Cove Fort</u>	<u>Colorado State Line</u>
<u>1-80</u>	<u>Nevada State Line</u>	<u>Wyoming State Line</u>
<u>1-84</u>	<u>Idaho State Line</u>	<u>Jct I-80 - Coalville</u>
<u>1-215</u>	<u>Jct I-80 - Parleys Canyon</u>	<u>Jct I-15 - North Salt Lake</u>
<u>US-6</u>	<u>Nevada State Line</u>	<u>Jct US-50 - Delta</u>
<u>US-6</u>	<u>Jct I-15 - Spanish Fork</u>	<u>Jct I-70 - Green River</u>
<u>US-40</u>	<u>Jct I-80 - Park City</u>	<u>Colorado State Line</u>
<u>US-50</u>	<u>Jct US-6 - Delta</u>	<u>Jct I-15 - Holden</u>
<u>US-89</u>	<u>Arizona State Line</u>	<u>Jct I-70 - Sevier</u>
<u>US-89</u>	<u>Jct I-70 - Salina</u>	<u>Jct SR-28 - Gunnison</u>
<u>US-89</u>	<u>Jct US-6 - Spanish Fork</u>	<u>Jct SR-73 - Lehi</u>
<u>US-89</u>	<u>SR-71 - Draper</u>	<u>Jct SR-269 - 5th and 6th South</u>
<u>US-89</u>	<u>Jct I-15 - North Salt Lake</u>	<u>Junctin I-15 Boutifful</u>
<u>US-89</u>	<u>Jct I-15 Farmington</u>	<u>Jct I-84 - Uintah</u>
<u>US-89</u>	<u>Jct I-84 - Uintah</u>	<u>Jct US-91 Brigham City</u>
<u>US-89</u>	<u>Jct US-91 - Logan</u>	<u>Idaho State Line</u>
<u>US-91</u>	<u>Jct I-15 - Brigham City</u>	<u>-Idaho State Line</u>
<u>US-189</u>	<u>Jct I-15 - South Provo</u>	<u>Jct US-40 - Heber City</u>
<u>US-191</u>	<u>Arizona State Line</u>	<u>Jct I-70 - Thompson</u>
<u>US-491</u>	<u>Jct US-191 - Monticello</u>	<u>Colorado State Line</u>

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<u>Table 9</u>		
<u>Category 1 Roads</u>		
<u>Route</u>	<u>Beginning</u>	<u>Ending</u>
<u>SR-9 - Zions Park</u>	<u>Junction I-15</u>	<u>Jct US-80 - Mt. Carmel Jct</u>
<u>SR-10 - Castle Valley</u>	<u>Jct I-70 - Fremont Jct</u>	<u>Jct US-6 - Price</u>
<u>SR-12 - Bryce Canyon</u>	<u>Jct US-89 - Panguitch</u>	<u>Jct SR-63 - Bryce Canyon</u>
<u>SR-13- Box Elder Co</u>	<u>Jct US-91 Brigham City</u>	<u>Jct SR-83 - Corrine</u>
<u>SR-26 – Riverdale Road</u>	<u>Jct 126-Roy</u>	<u>Jct US-89 - Ogden</u>
<u>SR-28 - Levan Desert</u>	<u>Jct US-89 - Gunnison</u>	<u>Jct I-15 - South Nephi</u>
<u>SR-30 – Box Elder/Cache Co</u>	<u>Jct I-15 - Riverside</u>	<u>Jct US-89 Logan</u>
<u>SR-31 - Huntington</u>	<u>Mile Post 33</u>	<u>Mile Post 49</u>
<u>SR-36 - Tooele Access</u>	<u>Jct entrance - Tooele Army Depot</u>	<u>Jct I-80 - Tooele Interchange</u>
<u>SR-39 - 12 th Street Ogden</u>	<u>Mile Post 0</u>	<u>Jct SR-203 - Harrison Blvd</u>
<u>SR-52 - 8th North, Orem</u>	<u>Jct I-15 - Orem</u>	<u>Jct US -189 - Olmstead Jct</u>
<u>SR-57 - Orangeville Bypass</u>	<u>Jct SR-10 - Hunter Power Plant</u>	<u>Entrance - Wilberg Coal Mine</u>
<u>SR-71 - 7th and 9th East Street, Salt Lake City</u>	<u>Jct SR0-209 - 90th South Street</u>	<u>Jct SR-186 - 4th South Street</u>
<u>SR-73 - Lehi Connection</u>	<u>Jct I-15 - South Lehi</u>	<u>Jct US-89 - South Lehi</u>
<u>SR-79 – 30th and 31st Street Ogden</u>	<u>Jct SR-126</u>	<u>Jct SR-203 - Harrison Blvd.</u>
<u>SR-83- Thiokol Road</u>	<u>Jct SR-13- Corrine</u>	<u>MP 25 Lampo Junction</u>
<u>SR-96 - Scofield Access</u>	<u>Mile Post 3</u>	<u>Mile Post 4</u>
<u>SR-101- Cache Co.</u>	<u>Jct US-91 Wellsville</u>	<u>Jct SR-65 - Hyrum</u>
<u>SR-108 – Antelope Drive / Midland Drive</u>	<u>Jct I-15 Mile Post 0</u>	<u>Jct 126 - West Haven</u>
<u>SR-104 20th 21st Street Ogden</u>	<u>Jct SR-126</u>	<u>Jct SR-204</u>
<u>SR-111 - Bacchus Highway</u>	<u>Jct SR-48 - Bingham Highway</u>	<u>Jct SR-201 - 21st South Expressway</u>
<u>SR-126 1900 West</u>	<u>Jct SR-108 Layton</u>	<u>Jct US-89 - So Willard.</u>
<u>SR-134 - 2700 North</u>	<u>Jct I-15 - North Ogden, Exit 352</u>	<u>Jct US-89 - North Ogden</u>
<u>SR-152 - Van Winkle Expressway</u>	<u>Jct SR-71 - 9th East Street</u>	<u>Jct I-215 - East (Exit 8)</u>
<u>SR-154 - Bangerter Highway</u>	<u>Jct I-15 - Draper</u>	<u>Jct I-80 - Salt Lake Intl Airport</u>
<u>SR-165 Cache Co.</u>	<u>Jct SR-101 - Hyrum</u>	<u>Jct US-91 - Logan</u>
<u>SR-171 - 33rd and 35th South, Salt Lake City</u>	<u>Jct SR-172 - 56th West Street</u>	<u>Jct I-215 - East, Exit 3</u>
<u>SR-172 - 56th West Street Salt Lake City</u>	<u>Jct 6200 South - Kearns</u>	<u>Jct I-80 - International Center</u>
<u>SR-186 Foothill Blvd</u>	<u>Jct SR-71 - 7th East Street, SLC</u>	<u>Jct I-215 - East (Exit 1)</u>
<u>SR-190 - Big Cottonwood</u>	<u>Jct I 215 - East, Exit 7, SLC</u>	<u>Jct SR-210 - Little Cottonwood</u>
<u>SR-193 – East Hill Field Road</u>	<u>Jct SR-126 - Clearfield</u>	<u>Jct US-89 - Layton</u>

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<u>Table 9</u>		
<u>Category 1 Roads</u>		
<u>Route</u>	<u>Beginning</u>	<u>Ending</u>
<u>SR-201 - 21st South Expressway</u>	<u>Jct I-80 - Lake Point</u>	<u>Jct I-15 - South Salt Lake</u>
<u>SR-203 - Harrison Blvd</u>	<u>Jct US-89 - South Ogden</u>	<u>Jct SR-39 - 12th Street</u>
<u>SR-204- Wall Ave</u>	<u>Jct SR-26 – Riverdale Road</u>	<u>Jct US-89 - Harrisville</u>
<u>SR-209 - 90th & 94th South</u>	<u>Jct SR-68 - Redwood Road (SLC)</u>	<u>Jct SR-210 - Little Cottonwood</u>
<u>SR-210 - Little Cottonwood</u>	<u>Jct SR-190 - Big Cottonwood</u>	<u>Jct SR-209 - 90th and 96th South</u>
<u>SR-232- Hill Field Road</u>	<u>Jct SR-126 - Layton</u>	<u>Hill Air Force Base</u>
<u>SR-264 - Skyline Mine Road</u>	<u>Mile Post 12</u>	<u>Mile Post 15</u>
<u>SR-265 - University Parkway</u>	<u>Jct I-15 - Exit 272</u>	<u>Jct I-215 East, Exit 5</u>
<u>SR-266 - 45th & 47th South Taylorsville</u>	<u>Jct I-215 - West, Exit 15</u>	<u>Jct I-215 - East, Exit 5</u>
<u>SR-269 - 5th & 6th South Salt Lake City</u>	<u>Jct I-215, Exit 310</u>	<u>Jct SR-71 - 7th East Street</u>
<u>Legacy Highway</u>	<u>Jct I-215</u>	<u>Jct. I-15</u>

END OF SECTION

Hot Mix Asphalt (HMA)

02741 - 35 of 350

~~January 1, 2005~~~~September 20~~~~May 25~~January 1, 20087

Standards Committee Submittal Sheet

Name of preparer: Bryan Lee/Tim Biel
Title/Position of preparer: Concrete Engineer/Engineer for Materials
Specification/Drawing/Item Title: Portland Cement Concrete Pavement
Specification/Drawing Number: 02752

Enter appropriate priority level:

(See last page for explanation) 4

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Virtually a complete rewrite of the specification to bring it up current with industry and AASHTO standards. Changes were made to materials, construction practices, mix design requirements, submittals, paving constraints, and on. Have also moved some issue to the Materials Manual of Instruction and Minimum Sampling and Testing Requirements where possible. Updated to match new version of 03055 PCC.

Rewrite was performed by a committee comprised of UDOT, paving and cement producer representatives in conjunction with 03055 PCC.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No change.

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

See Below

ACEC Comments: (Use as much space as necessary.)

Responded with No comments

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Desna Bergold, Region Two

Construction Engineers

Karl Verhaeren

Contractors (Any additional contacts beyond "C" above.)

Has gone through Utah Pavement Council, including representatives from Staker-Parsons, Geneva, Granite

Suppliers

Holcim (Todd Laker) and Ashgrove (Ben Blankenship)

Consultants (as required) (Any additional contacts beyond "C" above.)

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Others (as appropriate)

RME Group approved

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

Changes already incorporated in MS&T

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

No change

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Publishing the specification, notice will be given at Pavement Council.

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

Minimal. Use of blended cements and less powder may marginally reduce cost.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

None

3. Life cycle cost.

None

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Bring spec up to current State of Practice in industry.

H. Safety Impacts?

None

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Document has been a standard forever, with several special provisions addressing specific things. Changes were requested, in part, by industry to improve the mix design process and bring more in line with national procedures.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect **four weeks** later for projects being advertised.

Priority 4 2008 Book only

SPECIAL PROVISION

PROJECT #

SECTION 02752S

PORTLAND CEMENT CONCRETE PAVEMENT

~~Delete Section 02752 in its entirety replace with the following:~~

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Materials and procedures for constructing Portland Cement Concrete Pavement.

1.2 RELATED SECTIONS

- A. Section 00555: Prosecution and Progress
- B. Section 01452: Profilograph and Pavement Smoothness
- C. Section 03055: Portland Cement Concrete
- D. Section 03152: Concrete Joint Control
- E. Section 03211: Reinforcing Steel and Welded Wire
- F. Section 03390: Concrete Curing

1.3 REFERENCES

- A. AASHTO M 157: Ready-Mixed Concrete
- B. AASHTO M 324: Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements
- C. AASHTO T 22: Compressive Strength of Cylindrical Concrete Specimens
- D. AASHTO T 23: Making and Curing Concrete Test Specimens in the Field

- E. AASHTO T 24: Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
- F. AASHTO T 325: Estimating the Strength of Concrete in Transportation Construction by Maturity Tests
- G. American Concrete Institute (ACI) Standards
- H. Department of Labor Standards
- I. UDOT Minimum Sampling and Testing Requirements
- J. UDOT Quality Management Plan

1.4 SUBMITTALS

- A. All submittals required in Section 03055.
 - 1. Mix design trial batch information to include flexural test results.
- B. Certified scale axle weights for each haul unit in terms of yardage to be hauled, when requested by the Engineer.
- C. Portland Cement Concrete Pavement texturing plan.
- D. A written plan for approval, 14 calendar days before concrete placement, showing proper attention will be given to:
 - 1. ~~Ingredients~~
 - 2. ~~Production methods~~
 - 3. ~~Handling and~~ placing
 - 4. Sampling, testing, and storage, include details for platform or optional on-grade facilities.
 - 5. ~~Protection, and curing, including hot and/or cold weather plan or both, to prevent excessive concrete temperatures and water evaporation that could impair strength, integrity or serviceability of the concrete. Refer to ACI 305R-99~~
- E. Verification that the batch plant meets the requirements of the UDOT Quality Management Plan for Ready-Mix Concrete.

1.5 ACCEPTANCE

- A. Acceptance sampling and testing of material is in accordance with UDOT Minimum Sampling and Testing Requirements.
- B. Department will assess price adjustments for strength, thickness, and surface smoothness separately on the contract bid price.

C. Thickness

1. Contractor obtains cores for thickness. AASHTO T 24

a. Engineer marks location of cores.

b. One thickness core per 12,000 ft².

~~24. When placing Portland Cement Concrete Pavement over lean or untreated base course, d~~ Determine the acceptability and pay factors for deficient thickness areas using Table 1.

Table 1

Price Reductions for Deficient Thickness Over New Surfaces	
Deficient Thickness (In inches)	Pay Factor
0 to 1/8 ^{1/8}	1.00
1/8 ^{1/8} to 1/4 ^{1/4}	0.90
1/4 ^{1/4} to 1/2 ^{1/2}	0.75
1/2 ^{1/2} to 3/4 ^{3/4}	0.60
> 3/4 ^{3/4}	Reject

- a. The Engineer may accept pavement deficient by more than ~~3/4~~^{3/4} inch at 50 percent pay or require removal and replacement.
- b. Make all corrections, including removal and replacement, at no additional cost to the Department.
- c. ~~Contractor~~^{Engineer} takes two additional cores for any deficient core (one on each side) where the thickness varies by ~~1/8~~^{1/8} in. ~~Locate~~^{Locate} the new core between the deficient core and each of the adjacent cores.
- d. Engineer graphs the deficient areas by plotting new cores and the original cores to define deficient areas, assuming the following:
 - 1) The graph represents the thickness of the pavement.
 - 2) The thickness varies linearly along the pavement's length from core depth to core depth.
 - 3) The pavement is a constant depth in the transverse direction.

~~32. When placing Portland Cement Concrete Pavement over existing surfaces, thickness acceptance of the finished pavement is determined from the graph of the deviations from the profile grade established by the plans or Engineer.~~

~~a. Engineer takes elevations at 100 ft intervals, and compares against the profile and graph to determine deficient thickness areas.~~

~~b. Price adjustments for pavement areas with deviations below thickness profile will be computed using Table 2.~~

Table 2

Price Reductions for Deficient Thickness over Existing Surfaces	
Deviations Below Profile (in feet)	Pay Factor
0.0 to 0.02	1.00
0.02 to 0.04	.90
0.04 to 0.06	.60
>0.06	Reject

- ~~e. The Engineer may accept pavement deficient by more than 0.06 feet at 50 percent pay or require removal and replacement.~~
- ~~d. Make all corrections, including removal and replacement, at no additional cost to the Department.~~

CDC. COMPRESSIVE STRENGTH (ACCEPTANCE/RETESTING) Compressive Strength Acceptance Retesting

1. Department will use Table 3 to determine pay adjustments for concrete compressive strength.
 - a. The pay adjustment applies to the test lot represented by the strength test.
 - b. The Engineer evaluates all concrete with a compressive strength of more than 400 PSI below specification to determine structural integrity of the concrete pavement. This pavement may be accepted at 50 percent pay factor or removed and replaced at the discretion of the Engineer.

Table 3

Pay Adjustments for Compressive Strength Based on 28 days	
Psi below f 'c (4,000) *	Pay Factor
1 to 100	0.95
101 to 200	0.90
201 to 300	0.85
301 to 400	0.80

* From Section 03055 Table 3

2. Hand-placement areas will be considered separately.
3. Retesting - The Engineer notifies the Contractor, within three calendar days of determining the 28-day compressive strength, if any test is below specifications. The Contractor may request referee testing in writing. within 35 calendar days after placing concrete.
4. An independent third party testing agency will conduct referee testing within 35 calendar days after placement at no additional cost to the Department.
5. Retesting must be completed within 40 days after placement.

65. Testing laboratories must:
- Be a UDOT qualified lab in concrete.
 - Use UDOT TTQP concrete qualified personnel (Concrete Testing Technician and Concrete Strength Testing Technician).
 - Obtain two sets of three cores at locations directed by the Engineer.
 - Obtain and test cores in accordance with AASHTO T 22 and AASHTO T 24.
 - Calculate the average of each set of three cores.
 - Fill the core holes with concrete after coring
 - Make sure that the holes are cleaned with no standing water before they are filled.
 - Consolidate the concrete by rodding or vibrating.
 - Strike off level with the pavement surface and texture.
 - Protect concrete in core holes from any damage for a minimum of 48 hrs.
 - Basis of acceptance of the lot will be as follows:
 - If the average strength of both sets of three cores is greater than or equal to 85 percent of f'_c , and if no single strength test is less than 75 percent of f'_c , the Department accepts the lot at full pay.
 - If the above criteria are not met, the Department uses the original cylinder compressive strengths for the pay factor.

~~DE.~~ ~~SMOOTHNESS~~ Smoothness

- Evaluate in accordance with Section 01452.

F. Quantity Adjustment when paving over existing surfaces

- Adjust quantity when accepted batched volume overruns or underruns neat-line volume.
 - Engineer and Contactor determines accepted batched volume at time of placement
 - Accepted batched volume is the total batched material adjusted to design yield minus rejected or wasted material.
- Adjust quantity prior to any price adjustment for non-specification material.
- Determine overrun/underrun quantity by the following formula:

$$QA = 0.5 \left(\frac{V_a - V_n}{V_n} \right) Q_m$$

$$\underline{QA} = \underline{\text{Adjusted quantity in yd}^2}$$

$$\begin{array}{lcl} \frac{V_a}{V_n} & = & \frac{\text{Accepted Volume}}{\text{Neat-line Volume}} \\ \frac{Q_m}{V_n} & = & \frac{\text{Measured quantity in yd}^2}{\text{Neat-line Volume}} \end{array}$$

PART 2 PRODUCTS

2.1 CONCRETE

- A. Use AA (AE) concrete in accordance with Section 03055.
 - 1. Meet a 28-day flexural strength of 650 psi verified through trial batch.

2.2 CONCRETE CURING COMPOUND

- A. Refer to Section 03390.

2.3 EXPANSION JOINT MATERIALS

- A. Refer to Section 03152.

2.4 JOINT SEALERS

- A. Use hot applied joint sealant for all joints meeting Section 03152.

2.5 STEEL REINFORCEMENT

- A. Tie Bar: Grade 60 or higher, deformed reinforcing steel following Section 03211.
- B. Dowel Bars: Grade 60 or higher, smooth steel rod, following Section 03211.
- C. Chairs and Basket assemblies following Section 03211.

2.6 BATCH PLANT

- A. Meet the requirements of the UDOT Quality Management Plan for Ready-Mix Concrete.

2.7 TESTING PLATFORM

- A. PProvide a stable, 40 ft by 8 ft testing platform with a canopy when concrete is hauled in dump trucks.
 - 1. Provide a lockable 8 ft by 10 ft by 8 ft storage room at one end.

2. Locate the platform within 250 ft of the batch plant.
3. Platform height must equal the concrete haul truck bed height.
4. Platform must meet the Department of Labor standards outlined in Safety and Health Regulations for Construction.
5. Provide adequate railing, and stairs with a handrail.
6. Provide 110 V electrical power and pressurized water.
7. Maintain suitable lighting and electrical outlets and a communication system with the batch plant control room.
8. Furnish internal vibrators and storage devices for making and curing the test specimens as per AASHTO T 23.

2.8 CYLINDER STORAGE DEVICE

- A. Use a device that maintains a temperature of 60 degrees F to 80 degrees F and is equipped with an automatic 7-day temperature recorder, accurate within 2 degrees and having a permanent recording feature.
- B. Use device or devices with the capacity to accommodate the required test cylinders for a minimum of two day's operation.
 1. Cease concrete operation when the storage capacity is reached.
- C. Make the storage devices available on the job site at least 48 hours before placement.
- D. Upon request by the Engineer, submit written procedures explaining operation and required monitoring or care of the device for approval.
- E. A 24-hour test run may be required.

2.9 VEHICLES FOR HAULING

- A. Permissible to use:
 1. End dump trucks with essentially watertight beds and end gates, and rounded corners.
 2. Agitator trucks with open tops.
 3. Transit mixers that conform to AASHTO M 157.
- B. Do not use bottom or belly dump units.

2.10 SLIP FORM PAVER

- A. Self-propelled machine with no fluid leaks, equipped with automatic line and grade control capability.
- B. Capable of:

1. Spreading the dumped concrete uniformly across the grade by an auger or a traveling strike-off device.
 2. Vibrating, tamping, striking-off, and shaping the concrete to the desired line grade and thickness in one continuous pass.
- C. ~~Under normal operating conditions~~ Do not interfere with dowel basket assemblies if, do not place wheeled or tracked power equipment in front of the paver redistributing the concrete in front of the paver.
- D. Vibrator minimum requirements:
1. Eccentric Diameter: 1-⁷/₈ inch
 2. Frequency: 7000 to 9000~~9500~~ vibrations per minute, minimum.
 3. Spacing: 18 inch maximum, mounted longitudinally.
- E. Mount vibrators to insure adequate consolidation of the concrete. and ~~Do not interfere with dowel bar basket assemblies, such that they operate horizontally at the midpoint of the concrete slab and they maintain this position.~~
- F. Run the vibrators parallel to the direction of the paving.
- G. Monitor the operation of ~~Check each~~ vibrators
1. Check each vibrator at the beginning and ending of each day for operation daily.
 2. Repair or replace vibrators as necessary.
 1. ~~Equipped with continuous operational vibration monitoring devices.~~
 - a. ~~Monitoring device displaying the operating frequency of each individual internal vibrator with manual and automatic sequencing among all individual vibrators.~~
 - b. ~~Display near the operator's controls visible to the paver operator.~~
 32. ~~Shutdown~~ Stop paving operations immediately if any indication of malfunction occurs.
 43. Resume operations only after repairing or replacing the vibrator.
- H. Use ~~Trailing~~ forms: long enough to leave a smooth, straight, vertical edge.
- I. Stop ~~V~~ vibrating and tamping elements must stop when the forward movement of the paver stops.

2.11 FINISHING/TEXTURING EQUIPMENT REQUIREMENTS

- A. Machine float that may be attached to the paver.
- B. Burlap drag, unless using artificial-turf drag.
- C. Texturing equipment as approved by the Engineer.

- D. Curing compound application machine with a fully atomizing type power spray and a wind protection hood.

PART 3 EXECUTION

3.1 LINE AND GRADE CONTROL

- A. Use a system that limits deviations in the pavement surface to $\pm \frac{1}{8}$ inch and deviations in the vertical edge of the pavement to $\pm \frac{1}{4}$ inch, and maintains specified pavement thickness.
- B. Slip Form Paving
 1. Establish the necessary stakes for line and grade control over existing surfaces, and provide the elevation control benchmarks.
 2. Equip machinery with a control system that automatically controls concrete placement to the specified longitudinal grades.
 3. Control systems:
 - a. Must be automatically actuated from an independent line and grade control reference using a system of mechanical sensors or sensor-directed devices.
 - b. Use sensors that maintain the equipment at the proper transverse slope and elevation to obtain the required thickness and surface.
 - c. Furnish, place, and maintain supports, wire devices, and materials as required to provide continuous line and grade reference controls for the placing machine, etc.
- C. Formed Paving
 1. Keep forms free from warps, bends, kinks, and equal in depth to the specified pavement edge.
 2. Tightly join form sections by an interlocking joint free of vertical and horizontal movement.
 3. Stop paving operations if the side forms do not meet or hold line and grade.
 4. Provide vibrators to thoroughly consolidate concrete
 - a. Position vibrators on finishing equipment ahead of strike-off auger or final screed
 - b. For hand placements, use hand-operated vibrators on a regular pattern not to exceed 12 inches in each direction.
 5. Immediately apply curing compound to the edges of the pavement after form removal.
- D. Fill honeycomb areas in the vertical edge of the pavement with mortar.

3.2 BATCHING AND MIXING

- A. Conform to AASHTO M 157.
- B. Separate and stockpile in two sizes coarse aggregate sizes 2 inch to No. 4 sieve, and 1½ inch to No. 4 sieve with the separation being made on the 1 inch and ~~3~~⁴/₄-inch respectively.
- C. Mixing: Conform to the standard, and operate the drum at manufacturer's recommended speed.
 - 1. Conduct mixing efficiency tests at the start of concrete placement, and evaluate as specified in AASHTO M 157, Annex A-1.
 - 2. Maintain a mixing time of 80 seconds at manufacturer recommended mixing speed after all materials are in the drum. If necessary, increase mixing time in 10-second increments until the mixer efficiency evaluation is passed.
 - 3. Correct poor mixing efficiency at no additional cost to the Department.
 - 4. Do not allow buildup of cement or mortar on the mixer drums and blades.
 - 5. Mix for a minimum of 30 seconds after the last addition of water or cement is made after initial batching.
- D. Do not add water to the mix after acceptance testing.

3.3 PLACING CONCRETE

- A. Keep the base surface moistened 500 ft in front of the paver without allowing areas of standing water.
- B. Discharge and place the mixed concrete with a lay down machine within the time frame listed below after introducing the mixing water to the cement and aggregates. Reject concrete not placed within the following time period.
 - 1. Non-agitating Haul Equipment: ~~4~~³5 minutes.
 - 2. Agitating Haul Equipment: 75 minutes.
- C. Deposit the concrete so rehandling is not required.
- D. Vibrate, screed, and mechanically tamp the spread concrete. Thoroughly vibrate adjacent to and along the faces of the forms.
- E. Ensure workmanship conforms to ACI 304R-00.
- F. Do not add water to the pavement surface behind the final screed on the paver.
- G. Do not add water to the surface for finishing.
 - 1. Paving operations may be shut down and the concrete rejected if water is added.

- H. Concrete may be placed in an adjoining longitudinal section (companion placement) when 253000 psi has been achieved and verified by either:
 - 1. Maturity Method: Refer to AASHTO TM 325
 - 2. Field-Casture cylinders
- I. Provide protection for initial surface.
- J. Repair any damage to existing pavement resulting from companion placement at no expense to the Department.

3.4 HANDLING AND PLACING REINFORCING STEEL

- A. Keep reinforcing steel clean, free from damage, and free from distortion.
- B. Place tie bars in the middle third of the slab, as shown on the plans.
 - 1. Refer to PV series Standard Drawings.
 - 2. Place normal to direction of paving and parallel to the slab surface.
 - 3. Place by using automatic bar inserters, support on chairs, through forms, or drilled and epoxied in. Manual insertion is not permitted.
- C. When load transfer dowel bars are required, place bars in the middle third of the slab depth, parallel to the centerline and surface of the slab. Limit deviations from parallel to ¼ inch in the length of the dowel bar.

3.5 FINISHING

- A. Finish the surface smooth and true to grade by machine float immediately after placing concrete. Finish at a rate equal to the progress of the paving operation.
- B. If preliminary finishing is delayed more than 30 minutes after initial screeding, shut down the mixing operation until the situation is resolved.
- C. Texture the pavement by burlap drag.
 - 1. Use at least three plies of wet burlap and drag parallel to the centerline without tearing.
 - 2. Complete the drag finish with one pass.
 - 3. Spray water directly on the final burlap drag only in the quantity necessary to keep the burlap wet.

3.6 PAVEMENT TEXTURING

- A. Provide in writing to the Engineer prior to placing pavement a texturing plan showing texturing locations and describing methods that will be used for hand texturing. Refer to Table 4.

Table 4

Pavement Texturing Options	
> 50 mph	≤ 50 mph
Longitudinal Tining	Longitudinal Tining
Diamond Grinding	Diamond Grinding
Transverse Tining	Transverse Tining
	Artificial Turf Drag

- B. Demonstrate the performance of the texturing application method prior to commencement of main line paving
- C. Longitudinal Tining:
1. Produce grooves of $\frac{1}{8}$ inch by $\frac{1}{8}$ inch spaced $\frac{3}{4}$ inch apart and parallel to the longitudinal joint.
 2. Keep tining devices clean and free from encrusted mortar and debris to ensure uniform groove dimensions.
 3. Time tining finishing so that the grooves do not close up.
- D. Diamond Grinding:
1. Produce resultant surface in a parallel, corrugated type texture.
 - a. ~~Allowable width of grooves is $\frac{1}{16}$ inch to $\frac{1}{4}$ inch, consisting of grooves between 0.090 and 0.150 inches wide.~~
 - b. ~~2. Allowable~~ Use a distance between the grooves is $\frac{1}{16}$ inch to $\frac{1}{4}$ inch. ~~of between 0.060 and 0.13 inches.~~
 - c. ~~3. Maximum allowable height of ridges is~~ peaks of the ridges approximately $\frac{1}{16}$ inch ~~higher than the bottom of the grooves.~~
 4. Maintain cross slope drainage.
- E. Transverse Tining: Produce ~~$\frac{1}{2}$ - $\frac{1}{2}$ inch to $\frac{3}{4}$ - $\frac{3}{4}$ inch~~ (randomly spaced) spacing random, transverse grooves approximately $\frac{1}{16}$ inch to $\frac{1}{8}$ inch deep.
- F. Artificial Turf Drag:
1. Drag artificial turf along the pavement in the direction of paving.
 2. Use plastic turf that is wide enough to cover the entire pavement width and produce a uniform texture with corrugations $\frac{1}{16}$ inch to $\frac{1}{8}$ inch deep.
 3. Use turf with a blade density of 7200 blades/sq ft and each blade at least $\frac{3}{4}$ inch long.
 4. Continuously monitor the texturing operation.
 5. Weight the turf, if necessary to produce an acceptable texture using a uniformly distributed load.
 6. Remove buildup of cementitious or other materials that may produce an uneven or unacceptable texture.

3.7 CURING

- A. Refer to Section 03390.

3.8 PROTECTION

- A. Protect pavement against all damage and marring.
 - 1. Do not allow traffic on the pavement.
 - 2. Construct crossings to bridge the concrete as approved by the Engineer when necessary at no additional cost to the Department.
- B. Do not allow Contractor hauling equipment and traffic on the pavement until 100 percent of the design strength has been achieved. Verify strength by either:
 - 1. Maturity method: Refer to AASHTO ~~TM~~ 325
 - 2. CastField-cured cylinders
- C. Submit a written plan to the Engineer for approval 14 calendar days before concrete placement showing proper attention will be given to ingredients, production methods, handling, placing, protection, and curing to prevent excessive concrete temperatures and water evaporation that could impair strength, integrity or serviceability of the concrete. Refer to ACI 305R-99.

3.9 JOINTS

- A. Construct contact joints, sawed joints, or transverse expansion joints as shown on the plans.
- B. Keep the faces of all joints at right angles to the top surface of the pavement with all longitudinal joints parallel to the centerline and coinciding with the traffic lane lines.
- C. Longitudinal Contact Joints:
 - 1. Do not allow the finished surface across longitudinal contact joints to deviate from a straight line by more than $\frac{1}{4}$ ~~8~~ inch in 10 ft when tested with a straight edge.
 - 2. Cease operations until specified tolerances are achieved if the edge slump requirements are not satisfied within 200 ft.
 - 3. If the edge slump exceeds the specified $\frac{1}{4}$ ~~8~~ inch in 10 ft, repair the edge by the following procedures before placing adjacent concrete:
 - a. Saw off the slumped edge to the full thickness with a diamond saw.
 - b. Drill holes in the sawed edge and epoxy in new tie bars.
 - 4. Straighten bent tie bars and re-coat with epoxy paint at the bend point before placing concrete in the adjacent lane.
- D. Transverse Contact Joints
 - 1. Construct transverse contact joints normal to the centerline without keyways on the vertical face.

2. Use No. 10 by 18 inch dowel bars placed midpoint in the slab at 12 inches on center and embedded 9 inches on each side.
 3. Form joints with bars placed through the form or saw joints with bars drilled and epoxied.
- E. Longitudinal and Transverse Sawed Joints:
1. Single cut all transverse and longitudinal joints in accordance with Standard Drawings (PV Series).
 2. Saw joints before uncontrolled cracking occurs
 3. Conduct continuous sawing operations during both day and night regardless of weather conditions.
 4. Provide lighting during nighttime sawing.
 5. Thoroughly clean joints of all loose debris, cement powder, etc.
 6. Clean and dry joints before placing sealant.
 - a. Clean the joint with air at a minimum of 100 psi.
 - b. Equip air compressors with operating oil and water traps.
 7. Unless specified otherwise, use hot-pour joint sealant AASHTO M 324
 8. Fill the longitudinal joints flush in accordance with PV Series Standard Drawings ~~(PV Series)~~.
 9. Do not permit hauling equipment or traffic on the pavement before all sawed joints are sealed.
 10. Match joints in adjacent lanes to form a continuous line across the pavement width including the concrete shoulders.
- F. Form transverse expansion joints at structure approaches as shown on the plans by using a joint filler strip and joint sealer.
- ~~1. —Firmly support the filler strip by metal holder and end supports that remain in place after completing the pavement.~~
 - ~~2. —Secure the metal holder and end supports to prevent movement of the filler strip away from the position indicated on the plans when placing and vibrating the concrete.~~
 - ~~3. —Extend the joint filler the full width of the concrete being placed less 1/4 inch on each end.~~
 - ~~4. —Remove any concrete that flows around the ends of the joint filler.~~

3.10 DEFECTIVE PAVEMENT PANELS

- A. A panel is that area of pavement within the traffic lane bounded by two transverse joints.
- B. Engineer determines defective panels within 21 calendar days after placement.
- C. Repair or replace defective pavement panels at no additional cost to the Department.
 1. Complete repairs before acceptance testing for smoothness.

- D. Remove and replace panels when multiple full depth cracks separate the panel into three or more pieces.
- E. Use methods that do not disturb or damage adjacent panels.
- F. Remove and replace portions of panels within the traffic lane and the adjacent shoulder with any full depth transverse crack within 4 ft or less of a transverse sawed joint.
- G. Drill and epoxy tie-bars/dowel bars as required into existing pavement.
~~1. Coat the free end of all dowel bars with a release agent.~~
- ~~GH.~~ Match the profile and texture of existing pavement.
- ~~IH.~~ Repair any crack connecting joints appearing within 21 calendar days after placement.
 - 1. Rout to a 1-inch depth by ~~3/8~~¹/₈-inch width and seal with silicone sealant.
- ~~J.~~ Leave tight random cracks less than ¹/₆₄ inch wide undisturbed.

3.11 LIMITATIONS - GENERAL

- A. Adhere to limitations of Section 03055 except as modified below.
- B. Night Operations: Provide proper lighting from one-half hour after sunset to one-half hour before sunrise following Section 00555.
- C. Precipitation
 - 1. Cease operation when rain is threatening.
 - 2. Remove, replace, or repair any pavement damaged by rain or hail as directed at no additional cost to the Department.
- D. Surface evaporation
 - 1. Limitations apply at any time of the year when any combination of air temperature, relative humidity, and wind velocity, have the potential to impair the quality of fresh or hardened concrete or otherwise result in abnormal properties.
 - 2. Adhere to approved contractor pavement protection plan; this Section, ~~Article 3.89~~

3.12 LIMITATIONS – COLD WEATHER

- A. Cold weather limitations apply when the temperature is forecast to fall below 40 degrees F within 14 days of placement.

- B. Comply with the following regulations for placing concrete in cold weather:
1. Do not use chemical additives in the concrete to prevent freezing.
 2. Provide all necessary cold weather protection for in-place concrete (cover, insulation, heat, etc.).
 3. Do not place concrete in contact with frozen surfaces.
 4. Adequately vent combustion-type heaters that produce carbon monoxide.
 5. Protect the concrete from freezing until a compressive strength of at least 3,500 psi has been achieved, determined by either:
 - a. Maturity method: Refer to **AASHTO M 325 (Changed in rest of doc to T 323)**
 - b. Field cure cylinders
 6. Maintain moist conditions for exposed concrete to avoid loss of moisture from the concrete due to heat applied.
 7. Limit the drop in temperature next to the concrete surfaces when removing heat to 20 degrees F during any 12-hour period until the surface temperature of the concrete reaches that of the atmosphere.
 8. Determine the concrete temperature with a surface thermometer insulated from surrounding air.
 9. Paving may begin when base surface temperature is 36 degrees F in the shade and ascending.
 10. Cease operations when the ambient temperature is 45 degrees F in the shade and decreasing.
 11. Remove and replace concrete damaged by frost action at no additional cost to the Department.
 12. Do not use material containing frost or lumps.
- C. Heating Aggregate and Water
1. Provide and operate heating devices at no additional cost to the Department when heated aggregates are required.
 2. Use aggregates free of ice.
 3. Heat aggregates uniformly, avoid overheating or developing hot spots.
 4. Use either steam or dry heat.

3.13 LIMITATIONS - HOT WEATHER

~~A. Cool all surfaces that will come in contact with the concrete to below 95 degrees F.~~

- AB. Discontinue paving when ambient air temperature exceeds 100 degrees F in the shade.

END OF SECTION

Standards Committee Submittal Sheet

Name of preparer: John Butterfield/Tim Biel
Title/Position of preparer: Region Two Materials Engineer/Engineer for Materials
Specification/Drawing/Item Title: Slurry Seal
Specification/Drawing Number: 02789

Enter appropriate priority level:

(See last page for explanation) 4

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Rewrite and submission of current special provision based on moving to a more appropriate gradation and changing some format regarding submittals and mix design procedures.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No change.

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

See Below

ACEC Comments: (Use as much space as necessary.)

Responded with No comments

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Desna Bergold, Region Two

Construction Engineers

Karl Verhaeren

Contractors (Any additional contacts beyond “C” above.)

Has gone through 2 revisions through Utah Pavement Council, including representatives from Staker-Parsons, Geneva, Granite

Suppliers

Rusty Price, ISS – Granite requested that we include in-line testing of aggregates to allow easier blending of products during the process. This would be cheaper for the contractor and the Department. We had several discussions, and agreed that it was a valid request, but due to the unresolved questions of what to do with non-spec materials that were already on the road, we agreed that this should be dealt with through a special provision until we could iron out the specifics.

Consultants (as required) (Any additional contacts beyond “C” above.)

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Others (as appropriate)

RME Group approved

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

Changes are attached. May be further modified if we accept continuous testing.

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

No change

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Publishing the specification, notice will be given at Pavement Council.

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

If anything, price will go down due to reduced handling.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

Currently no change. Continuous testing puts testing onus on the Contractor.

3. Life cycle cost.

Should be increase due to elimination of marginal and inconsistent mix designs

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Less workload and better timing for Region Field personnel.

H. Safety Impacts?

None

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Document has been a special provision for at least three years. Changes were requested, in part, by industry to improve the mix design process and bring more in line with national procedures.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |
| Priority 4 | 2008 Book only |

SECTION 02789

ASPHALT SLURRY SEAL COAT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Products and procedures for mixing and spreading a properly proportioned mixture of fine graded aggregate, mineral filler, emulsified asphalt, and water.
- B. Products and procedures for a cured slurry with a homogeneous appearance, a firm surface adhesion, and a skid resistant texture.

1.2 REFERENCES

~~B. Section 01452: Profilograph.~~

- A. AASHTO M 17: Standard Specification for Mineral Filler for Bituminous Paving Mixtures
- B. AASHTO M 29: Standard Specification for Fine Aggregate for Bituminous Paving Mixtures
- C. AASHTO M 208: Standard Specification for Cationic Emulsified Asphalt

~~D. AASHTO T2: Sampling of Aggregates~~

~~D.E.~~ AASHTO T 11: Material Finer than 75 µm (No. 200) Sieve in Mineral Aggregate

~~E.F.D~~ AASHTO T 27: Sieve Analysis of Fine and Coarse Aggregates

~~F.G.~~ AASHTO T 96: Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

- ~~HG.~~ AASHTO T 104: Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
- ~~H.I.~~ AASHTO T 176: Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test
- ~~IJ.~~ AASHTO T 278: Surface Frictional Properties Using the British Pendulum Tester
- ~~KJ.~~ AASHTO T 279: Accelerated Polishing of Aggregates Using the British Wheel
- ~~KL.~~ ~~ASTM D 3910: Design, Testing, and Construction of Slurry Seal~~ (Note: Not found in text. Delete here or add in text. Renumber as required.)
- ~~LM.~~ ISSA A105 Guidelines
- ~~MN.~~ UDOT Minimum Sampling and Testing Requirements

1.3 ~~MINIMUM SAMPLING AND TESTING REQUIREMENTS~~ **CONTRACTOR SUBMITTALS**

~~A.~~ Contractor Submittals

- ~~1A.~~ Submit Mix Design and test results to the Engineer, 10 days prior to beginning construction.
 - ~~1.~~ Meet the requirements of this ~~s~~Section, article 2.7.
 - ~~12.~~ Include target gradation for combined aggregate and mineral filler.

~~2B.~~ Provide test reports for aggregate.

- ~~1.~~ Meet the requirements of this ~~s~~Section, article 2.2.
- ~~Aggregate~~

~~a.~~ Certificate of Compliance material meets AASHTO

M 29

~~b.~~ Test Reports

- ~~1)~~ Soundness (Na₂SO₄), AASHTO T 104
- ~~2)~~ Sand Equivalent AASHTO T 176
- ~~3)~~ LA Wear AASHTO T 96

~~C.~~ Provide a Manufacturer's Certificate of Compliance for Mineral Filler.~~3.~~

~~Mineral Filler: Certificate of Compliance materials meets AASHTO M 17~~

~~4.~~ Target gradation for combined aggregate and mineral filler.

~~5.~~ Test results for Slurry Seal mix.

- ~~a.~~ Slurry Seal consistency ISSA TB 106

- ~~b. Wet Cohesion: 30 minute and 60 minute, ISSA TB 139~~
- ~~c. Excess Asphalt by LWT Sand Abrasion, ISSA TB 109~~
- ~~d. Wet Stripping, ISSA TB 114~~
- ~~e. Wet track abrasion loss, one hour soak, ISSA TB 100~~
- ~~f. Mix Time, ISSA TB 113~~

~~6D. Provide verification that the emulsified asphalt supplier adheres to UDOT Minimum Sampling and Testing Requirements Section 508 Asphalt Emulsion Quality Management Plan.~~

Emulsified Asphalt

- ~~a. Provide a Certificate of analysis/compliance from the manufacturer for each shipment.~~

~~7. Resident Engineer approved submittals.~~

~~B. Quality Assurance for aggregate stockpiles, performed by the Department~~

- ~~1. Aggregate stockpile sieve analysis, AASHTO T 2, T 27 / T 11~~
 - ~~a. Stockpiles are approved a minimum of one and maximum of seven days prior to use.~~
 - ~~b. One gradation per 500 tons of material (estimated) in stockpile.~~
 - ~~c. Out of specification material will be rejected.~~

~~C. Documentation/Report~~

- ~~1. Verification emulsified asphalt supplier adheres to UDOT Minimum Sampling and Testing Requirements Section 508 Asphalt Emulsion Quality Management Plan from the UDOT website. Refer to <http://www.udot.utah.gov/index.php/m=c/tid=719> for dated, signed, qualified list printout.~~

Table 1	
Gradation Upper and Lower Limit Determination	
Parameter	UL and LL
1/2" sieve for 3/4 inch BWC (Type C)	Target Value \pm 6.0 percent
3/8" sieve for 1/2 inch BWC (Type B)	
# 4 sieve	Target Value \pm 6.0 percent
# 8 sieve	Target Value \pm 5.0 percent
#50 sieve	Target Value \pm 3.0 percent
# 200 sieve	Target Value \pm 2.0 percent
Asphalt Binder Content	Target Value \pm 0.35 percent

Table 1	
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# 200 sieve	Target Value \pm 2.0 percent
Asphalt Binder Content	Target Value \pm 0.35 percent

PART 2 PRODUCTS

2.1 EMULSIFIED ASPHALT

- A. Use a cationic emulsified asphalt grade CQS-1H as specified in AASHTO M 208.
- B. Use a polymer modified emulsion CQS-1HP, meeting CQS-1H specifications identified in AASHTO M 208 and ISSA A 105, using solid synthetic rubber or latex material.
 - 1. Combine the polymer modifier with the base asphalt or asphalt emulsion at a minimum rate of 3 ~~percent~~% solids by weight of asphalt, prior to loading at the manufacturing plant.
 - 2. Use a polymer modified emulsion compatible with the mix design developed for the conventional slurry seal.
- ~~C. Provide a certificate of analysis/compliance from the manufacturer for each shipment of emulsified asphalt to the Engineer.~~
- ~~D.~~ Verify that the shipment is the same as the mix design.
- ~~E.~~ Adhere to UDOT Minimum Sampling and Testing Requirements Section 508 Asphalt Emulsion Quality Management Plan.

2.2 AGGREGATE

- A. Use 100 percent manufactured sand, slag, crushed fines, or a combination as specified in AASHTO M 29.

- B. Use aggregate that is clean and free from organic matter or other detrimental substances⁵.
- C. Use an aggregate blend with a sand equivalent of forty five or more. AASHTO T 176.
- D. Meet a minimum polishing value of 31. AASHTO T 278, AASHTO T 279.
- E. Use aggregate with 35 percent or less loss by abrasion. AASHTO T 96.
- F. Meet 15 percent soundness maximum using Na₂ SO₄. AASHTO T 104.⁵

2.3 MINERAL FILLER

- A. Use Portland cement, hydrated lime, or aluminum sulfate as specified in AASHTO M 17.

2.4 COMBINED AGGREGATE AND MINERAL FILLER

- A. Use a job mix or target gradation within the gradation band. Base the mix design on this gradation. After the target gradation has been submitted the percent passing each sieve will not vary by more than the stockpile tolerance and still remain within the gradation band. AASHTO T 11, AASHTO T 27. Refer to Table 1.

Table 1

<u>Gradation</u>		
Sieve Size	Gradation Band (% Passing)	Stockpile Tolerance
<u>3/8</u>^{3/8} inch	100	
No. 4	70-90	+/- 5%
No. 8	45-70	+/- 5%
No. 16	28-50	+/- 5%
No. 30	19-34	+/- 5%
No. 50	12-28	+/- 4%
No. 100	7-18	+/- 3%
No. 200	5-15	+/- 2%

2.5 WATER

- A. Potable and free from harmful salts and contaminants.

2.6 ADDITIVES

- A. Use additives as required to accelerate or retard the break-set of the slurry seal or to improve the resulting finished surface.
1. Determine the initial additive quantities by the mix design for the slurry mix or individual materials.
 2. Obtain Engineer approval.

2.7 SLURRY SEAL MIX DESIGN

- A. Provide the Engineer with the test results and the proposed mix design from an UDOT approved laboratory conforming to the following tests in ISSA A105.
1. Use the same materials and aggregate gradation to be used on the project.
, 10 days prior to beginning construction.

ISSA TEST NO.	DESCRIPTION	SPECIFICATION
ISSA TB 106	Slurry Seal Consistency	2cm Minimum; 3cm Max.
ISSA TB-139 (For quick-traffic systems)	Wet Cohesion 30 Minutes Minimum (Set) Wet Cohesion 60 Minutes Minimum	12 kg-cm Minimum 20 kg-cm Minimum
ISSA TB 109 (For heavy-traffic areas only)	Excess Asphalt by LWT Sand Abrasion	50 g/ft ² Maximum (538 g/m ² Maximum)
ISSA TB-114	Wet Stripping	Pass (90% Minimum)
ISSA TB-100	Wet-Track Abrasion Loss, One-hour Soak	75 g/ft ² (807 g/m ²)
ISSA TB-113	Mix Time**	Controllable to 180 Seconds Minimum

** Perform the mixing test and set-time test at the highest temperatures expected during construction.

- ~~B. Submit the mix design to Engineer using the same materials and aggregate gradation to be used on the project.~~

2.8 EQUIPMENT

- A. Use only a machine designed and manufactured specifically for blending, mixing, and placing slurry seal.
 - 1. Mix the material in a self-propelled, slurry seal mixing machine of either truck-mounted or continuous-run design.
 - a) Continuous-run machines: equipped to self-load materials while continuing to lay slurry seal.
 - b) Either type machine: accurately deliver and proportion the aggregate, emulsified asphalt, mineral filler, control setting additive, and water to a revolving mixer and to discharge the mixed product on a continuous-flow basis.
 - 2. Maintain sufficient storage capacity within the machine for aggregate, emulsified asphalt, mineral filler, control additive and water to maintain an adequate supply to the proportioning controls.
- B. Calibrate each mixing unit in the presence of the Engineer before a machine is used on a project

PART 3 EXECUTION

3.1 LIMITATIONS

- A. Do not apply slurry seal during rain, when road surface moisture is present, or during other adverse weather conditions.
- B. Do not apply slurry seal if either the pavement or air temperature is below 50 degrees F and falling. Slurry seal may be applied when both the pavement and air temperatures are above 45 degrees F and rising.
- C. Do not apply slurry seal when the temperature is projected below 33 degrees F within 24 hours of placing slurry seal.
- D. Cease slurry seal operations when weather or other conditions prolong opening road surface to traffic beyond two hours.
- E. Keep traffic off roadway surface until the slurry seal has cured.

3.2 STOCKPILING

- A. Construct individual 500 ton stockpiles of slurry seal aggregates.
1. Engineer approves stockpiles a minimum of one and a maximum of seven days prior to use.
- B. Notify the Engineer a minimum of seven calendar days prior to slurry seal placement in order for the initial stockpiles to be sampled and tested for acceptance.
- C. Obtain the Engineer's written acceptance of all stockpiles prior to use in slurry seal.
- D. Remove material not meeting specifications from the stockpile area.
- E. The Department will retest corrected material for acceptance.

3.3 PREPARATION

- A. Clean the surface of all dirt, sand, dust, oil, and other objectionable material immediately prior to applying the slurry.
- B. Allow cracks to dry thoroughly before applying slurry seal when using water to clean the surface.
- C. Protect manholes, valve boxes, drop inlets and other service utility entrances prior to surfacing.

3.4 APPLICATION

- A. Pre-wet the entire surface by fogging ahead of the slurry box. Do not over apply, causing free water to sit on the pavement in front of the slurry box.
- B. Carry a sufficient amount of slurry in all parts of the spreader at all times so that full width and complete coverage is obtained with no streaks or narrow spots. Avoid overloading the spreader.
- C. Apply slurry mixture of proper consistency at an average rate of 18 to 22 lb/yd².
- D. Do not add additional water for any reason, once the mixture has been placed onto the road surface.

- E. Remove and replace the slurry if any of the following occurs:
 - 1. Lumping, balling, or unmixed aggregates.
 - 2. Separation of the coarse aggregate from the emulsion and fines.
 - 3. Settling of the coarse aggregate to the bottom of the mix.
 - 4. Excessive breaking of emulsion inside the spreader box.
 - 5. Streaking caused by oversized aggregate.

3.5 FINISHING DETAILS

- A. Do not create build-up when constructing longitudinal and transverse joints.
- B. Place slurry seal adjacent to concrete pavements or concrete curb and gutter with a straight longitudinal edge. Do not allow over-lap on these areas.
- C. Maintain straight lines at all locations.
- D. Place slurry seal at side streets and intersections out to right-of-way line.
- E. Use hand squeegees to spread slurry in areas that cannot be reached with slurry seal machine.
 - 1. Lightly dampen areas prior to mix placement.
 - 2. Provide complete and uniform coverage.
 - 3. Avoid unsightly appearance from hand work.
 - 4. Use the same type of finish in hand worked areas as applied by the spreader box.
- F. Use construction paper or comparable products so all beginning and ending joint lines from each construction pass are straight.

END OF SECTION

Standards Committee Submittal Sheet

Name of preparer: Wes Starkenburg
Title/Position of preparer: Operations Design Engineer
Specification/Drawing/Item Title: GW 3 Concrete Curb and Gutter Details
GW 4 Concrete Driveways and Sidewalks
Specification/Drawing Number: Drawings GW 3 and GW 4

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.
- Changed GW 3 to flatten curb at location where ADA ramps will be installed.*
Changed GW 4 to redesign Flared Driveway o ease construction.
- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.
- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at
<http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

See comment resolution form

ACEC Comments: (Use as much space as necessary.)

No comments

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

See distribution list

Construction Engineers

Covered as shown on distribution list

Contractors (Any additional contacts beyond "C" above.)

No contacts beyond AGC

Suppliers

Suppliers are not affected by this change

Consultants (as required) (Any additional contacts beyond "C" above.)

No contacts beyond ACEC

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

FHWA has been involved in the review committee for these drawings. They also were provided a copy for further review

Others (as appropriate)

None

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

No effect on sampling and testing

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

No effect on business systems

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Newly published drawings will provide notification of changes

- F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

No significant changes in construction costs

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

No significant changes in operational costs

3. Life cycle cost.

No significant changes in life cycle costs

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Benefits from flattening curb are to facilitate complying with requirements for ADA ramps

Benefits from changes to driveway are clarity, which should reduce construction costs

H. Safety Impacts?

No significant changes

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

These changes have not been submitted to the committee previously

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

Std Dwg/Spec Number	GW 3 and GW 4	Sheet 1	of	4
Date:	9/19/07	Facilitator:	Wes Starkenburg	

Review Comments Form

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
1	Scott Andrus	GW 3	Wes, I only had one comment in the first sentence in the note on GW 3 "corner" at the end of the sentence is misspelled.	A	A
			Response: corrected		
2	Betty Purdie	GW 3	GW3: Note 1, how long do the transitions from std to flattened need to be? At what point of the handicap ramp does the curb need to be flattened? Also, corner is misspelled.		
			Response:	B	
3	Betty Purdie	GW 4	GW4: Open driveway - is reference to construction contractor joint correct - do you mean contraction joint, construction joint or what?		
			Response: Changed drawing to contraction joint	A	A.
4	Betty Purdie	GW 4	GW 4 Flared driveway - Why are we putting the flares out 1' past the driveway section in the sidewalk? I feel that this may introduce additional points for cracking to occur and it doesn't seem to have a purpose.		
			Response: Added 1 foot to avoid flare coming to a sharp point where it will crack.	C	C
5	Betty Purdie	GW 4	Table - Calculation for flared driveways is not correct 2 x AGL is a length not an area.	A	A
			Response: Should have read 2 feet. Made corrections		
6	ACEC	GW 3	The Note at the bottom right corner of the page is not intended to refer to the Curb & Gutter Transition Detail above it to transition to and from flattened gutters is it? If the transition is not specified in plans, I suppose the contractor will determine an appropriate rate to warp the gutter for each pedestrian ramp location in the field.	A	A
			Response: Does refer to flattened C&G. Change in lip elev is slight. Contractor can warp		
7	ACEC	GW 3	I know the Curb & Gutter Transition Detail drawing on this proposed GW 3 is unchanged from that shown on the current GW 3, but can the drawing be modified to more correctly show the Curb & Gutter Type M1 where the leaders identify it at the top end of the detail?	A	A
			Response: Will try to clarify		
8	ACEC	GW 4	Note 4 does not seem very clear. Is the note directed at the contractor or at the UDOT inspector?	A	A
			Response: Note is for inspector. Not normally done but required to clarify pay limits. Will revise note to clarify		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet

Review Comments

Std Dwg/Spec Number	GW 3 and GW 4	Sheet 2	of	4
Date:	9/19/07	Facilitator:	Wes Starkenburg	

9	ACEC	GW 4	Regarding the Flared Driveway detail, the change to the detail will now require at least a 4' wide sidewalk behind the sloped driveway apron. In cases where a driveway is reconstructed in an area with less than about 8' between the back of curb and the right-of-way line, either additional right-of-way would be acquired for the sidewalk, or a project specific detail would be developed (probably considering Note 5C) and approved as a part of the design exception process. Was this the intent of the change?	A	A
			Response: Yes that is the intent of note 5C		

10	ACEC	GW 4	The name of the manual referred to in Note 1 has been changed slightly. I believe it should be Administrative Rule R930-6 "Accommodation of Utilities and the Control and Protection of State Highway Rights of Way"	A	A
			Response: Will change		

11	ACEC	GW 4	a. Though the 12% max change in grade has been retained (moved from the "Slope Detail" to the "Section A-A" and shown specifically at the joint behind the sidewalk), no reference is made to a maximum slope on the revised drawing. Is this intended to defer to the driveway parameters (including slopes) that are found in the Administrative Rule R930-6 "Accommodation of Utilities and the Control and Protection of State Highway Rights of Way"? Should this be referenced regarding slopes? Would it be helpful to still include maximum grades on this drawing?	C	C
			10:1 max slope for drive is shown on plan view		

12	ACEC	GW 4	b. The 6' minimum dimension of sidewalk has been eliminated on the left side of the Flared Driveway detail. Is this a minimum dimension needed for sidewalk adjacent to the curb & gutter.	A	A
			6' min added		

13	ACEC	GW 4	c. Also on the Flared Driveway detail, the dimension of the flares on either side of the driveway has been reduced by 3'-6", which could noticeably narrow entrances. Was the 1' dimension on both sides of the driveway added to partially offset this change. Was the extra width shown previously determined to be unnecessary or to be a problem?		
			3' 6" was eliminated because it was confusing to construct. New detail does have smaller opening for the same driveway width. If additional width is required it can be had by increasing Driveway Width (DW) dimension. 1" dimension was added to avoid an area where concrete section comes to a point. In the past the points have experienced cracking.	C	C

14	Jared Dastrup	GW 3	How does this affect GW 2? It looks like it is in direct conflict.		
			Flattened curbs are for radii with ADA ramps. Will add note to clarify.	A	A

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet

Review Comments

Std Dwg/Spec Number	GW 3 and GW 4	Sheet 3	of	4
Date:	9/19/07	Facilitator:	Wes Starkenburg	

15	Jared Dastrup	GW 3	If the flattened curb and gutter is just for ADA Ramps is that not covered in the GW 5 drawings.	C	C
			Curbs are often built prior to ADA ramps. This indicates curb requirements at ramps		

16	Jared Dastrup	GW 3	How does this effect the drainage getting off the road	C	C
			Gutter pan still slopes toward curb. Roadway crossing remains. Water should exit roadway. However flattened curbs are subject to ponding during storms and collection of debris, which is an unsolved issue at ped ramps		

17	Jared Dastrup	GW 3	What about all of the notes that go along with the curb and gutter on GW 5.	C	C
			This works in conjunction with GW 5 series		

18	Jared Dastrup	GW 4	Why did we eliminate the option of having a 6 foot sidewalk with no planter area between the side walk and the curb, with 12:1 slopes on the flared driveway?	C	C
			Detail still shows option of sidewalk instead of park strip. Flare will be 10:1 max. Can be flatter is designer wishes.		

19	Jared Dastrup	GW 4	What is DL, AGL, FW, and FW-1?	C	C
			Plan view identifies these dimensions		

20	Jared Dastrup	GW 4	Move 4 foot sidewalk dimensions off of the sidewalk area so you can read it.	A	A
			Moved dimension out of hatched background		

21	Jared Dastrup	GW 4	The area behind the sidewalk should not be part of the area to be paid with a flared driveway.	C	C
			Approach (area from back of SW to RW needs to be paid some where. This is a logical place		

22	Jared Dastrup	GW 4	Is FW and FW-1 the same width?	C	C
			FW-1 is FW minus 1' as shown on plan view		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet			Review Comments		
Std Dwg/Spec Number	GW 3 and GW 4		Sheet 4	of	4
Date:	9/19/07		Facilitator:	Wes Starkenburg	

23	Jared Dastrup	GW 4	The driveway opening is DW+2+FW+FW-1 Width is correct as shown	C	C
----	---------------	------	---	---	---

24	Jared Dastrup	GW 4	Do you have to have 4 feet behind the flared driveway in all cases? Is there an option to have 12:1 on the driveway?	C	C
			Length will vary with height of curb, difference in elevation from curb to sidewalk, etc. 10:1 is max slope, can be flatter as condition permits and designer desires		

25	David Schwartz	GW 4	Are we eliminating park strip	C	C
			No		

26	David Schwartz	GW 4	Re max breakover.	A	A
			Changed to read algebraic difference		

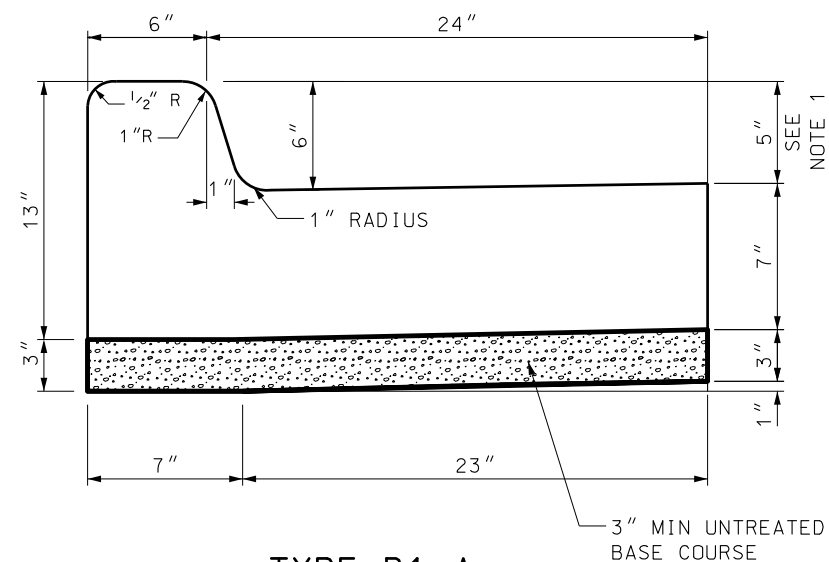
27	David Schwartz	GW 4	Should drive way max slope be 12:1.	C	C
			No leave as 10:1 as before		

28	Fred Jenkins	GW 4	2(AGL) yields feet not sq t	A	A
			Changed formula, shows results of calcs		

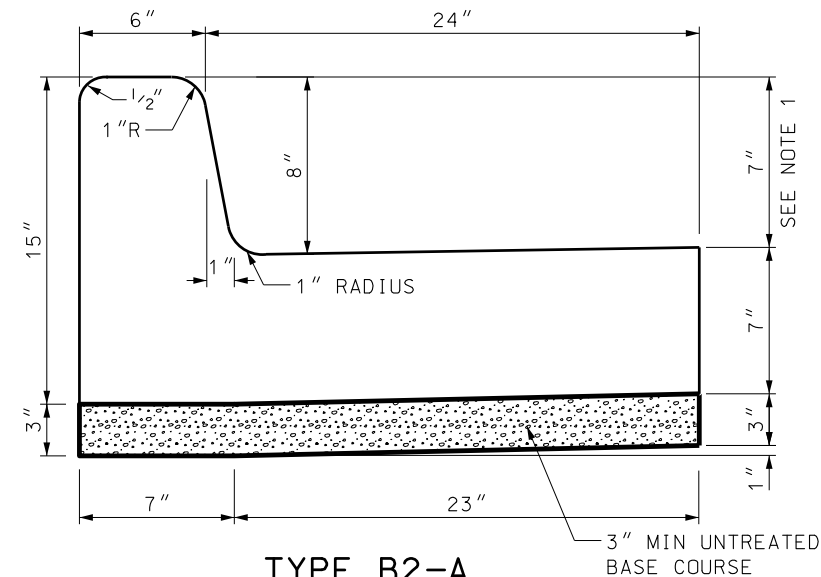
29	Fred Jenkins	GW 3	C & G on GW 3 looks same as GW 2	A	A
			Gutter plan flattened, will clarify		

30	Tim Biel	GW 3	Should read Hot Mix Asphalt	A	A
			Will correct		

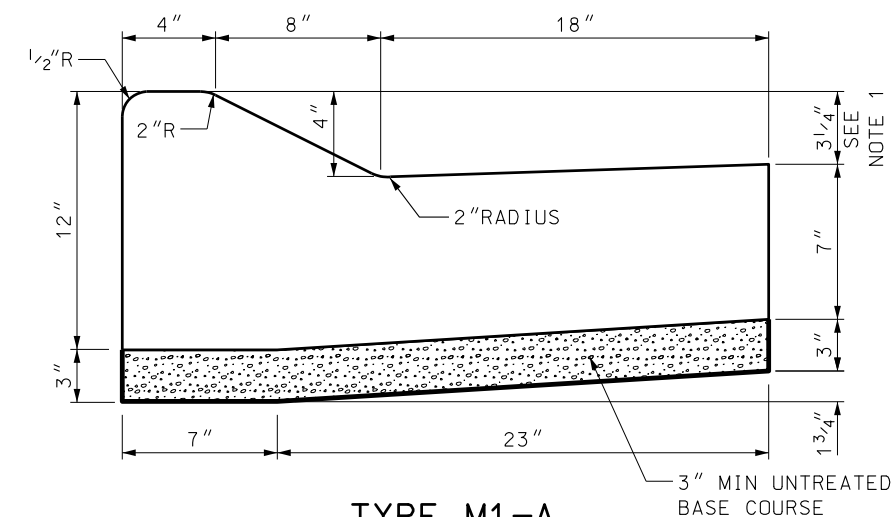
Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate



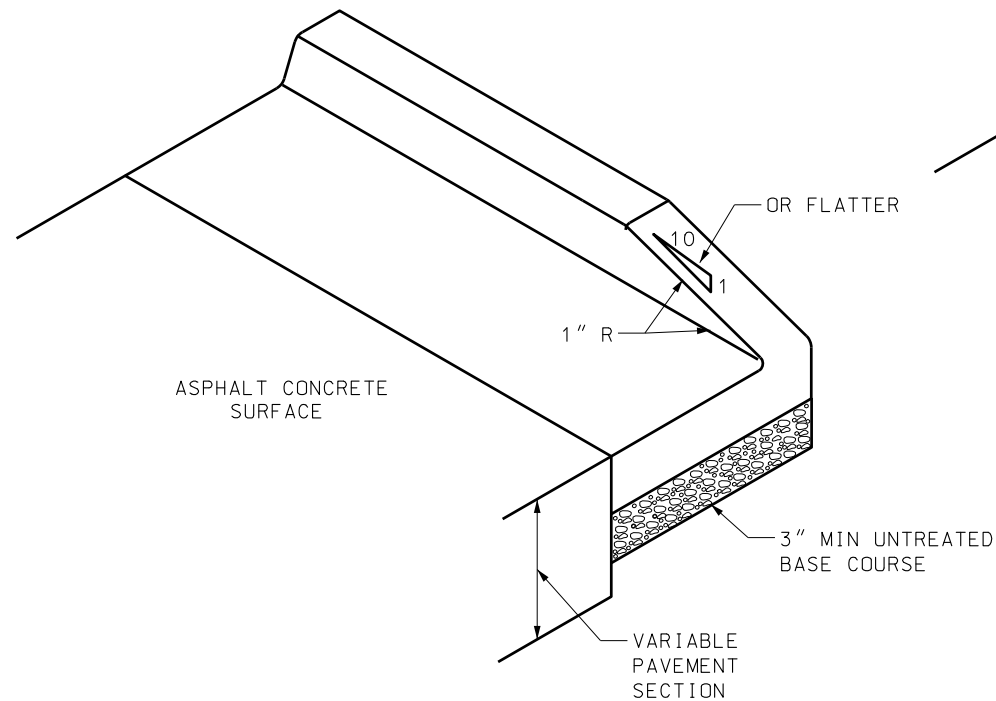
CURB & GUTTER
GUTTER PAN SLOPE REDUCED FOR ADA RAMP
AREA = 1.680 SQ FT



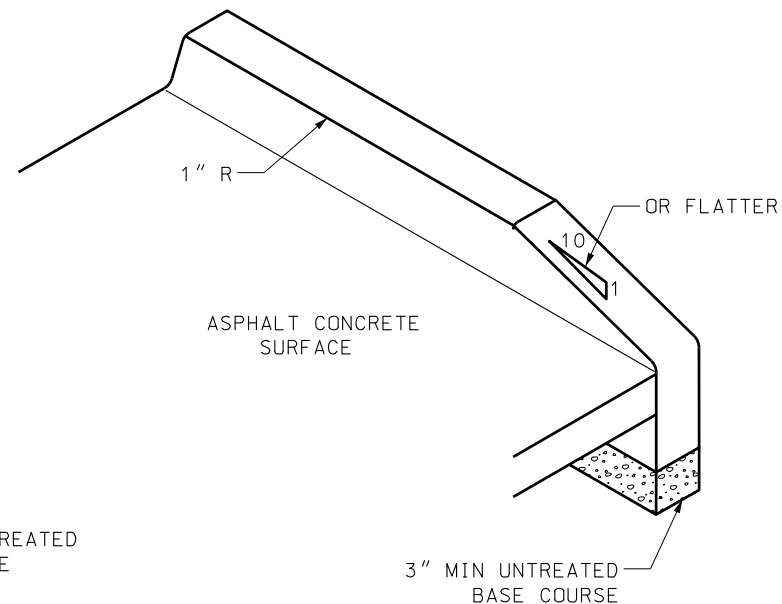
CURB & GUTTER
GUTTER PAN SLOPE REDUCED FOR ADA RAMP
AREA = 1.765 SQ FT



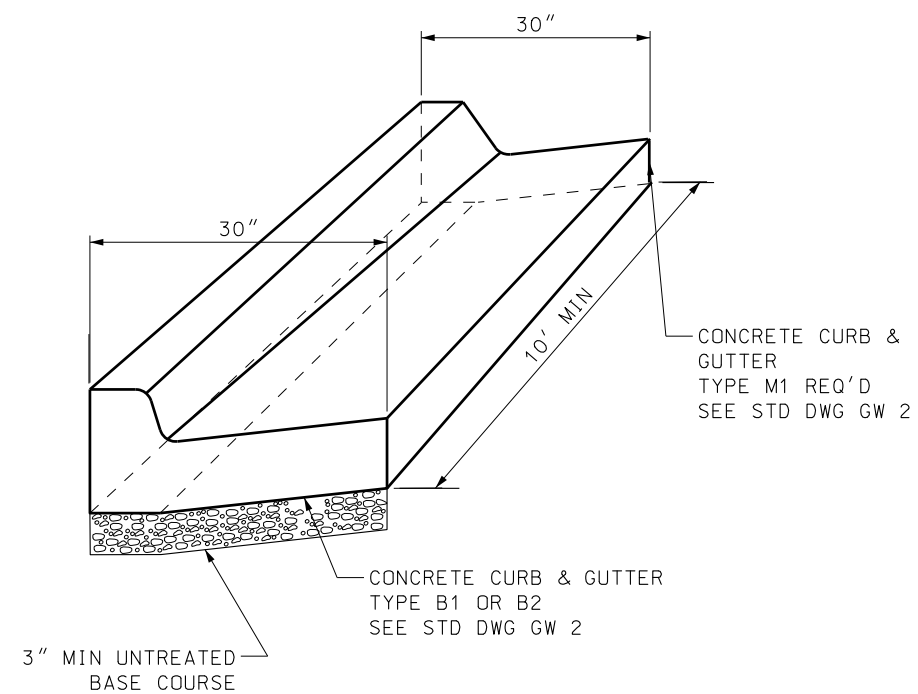
CURB & GUTTER
GUTTER PAN SLOPE REDUCED FOR ADA RAMP
AREA = 1.700 SQ FT



TYPICAL
CURB & GUTTER
END DETAIL



TYPICAL
CURB END DETAIL

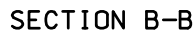
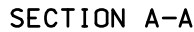


CURB & GUTTER
TRANSITION DETAIL

NOTE:

1. AT ADA RAMP LOCATIONS, FLATTEN GUTTERS AS SHOWN. WHERE MORE THAN ONE RAMP WILL BE CONSTRUCTED AT A CORNER, FLATTEN GUTTER BETWEEN RAMPS AS WELL AS AT CURB RAMPS.

[illegible]



DRIVEWAY RADIUS AND FLARE AREA CHART			
OPEN CONCRETE DRIVEWAY	f+ ²	FLARED DRIVEWAY	
6' RADIUS	44.13	DISTANCE FROM BACK OF CURB TO SIDEWALK	FLARE AREA
NOTE:		4'	49 f+ ²
f+ ² QUANTITY = BOTH SIDES OF		6'	61 f+ ²
DRIVEWAY ROUNDED TO THE		8'	89 f+ ²
NEAREST 0.5 f+ ²		10'	105 f+ ²
		ADD (DL)(DW) FOR TOTAL QUANTITY	



1. DRIVEWAY DIMENSIONS (MAX.& MIN.) ARE LOCATED IN UDOT ADMINISTRATIVE RULE R930-6 ACCOMMODATION OF UTILITIES AND THE CONTROL AND PROTECTION OF STATE HIGHWAY RIGHTS OF WAY" CURRENT EDITION.
2. MAXIMUM DISTANCE BETWEEN TOOLED OR CONSTRUCTION JOINTS 10' Laterally and longitudinally spaced equally.
3. PROVIDE EXPANSION JOINTS WHERE CONCRETE SIDEWALK BUTTS AGAINST CONCRETE DRIVEWAYS AND IN CONCRETE SIDEWALK AT 30 FEET INTERVALS.
4. SIDEWALK INSIDE THE DRIVEWAY LIMITS IS PAID AS PART OF DRIVEWAY, NOT AS PART OF SIDEWALK.
5. OPEN CONCRETE DRIVEWAY - FLARED DRIVEWAY
 - A: RESIDENTIAL = 6 inch THICK, COMMERCIAL = 7 inch THICK USE THESE THICKNESSES FOR APRON, SIDEWALK, APPROACH, FLARE, AND RADII.
 - B: EXTEND DRIVEWAY APPROACH TO R/W - PROPERTY LINE OR 25' WHICHEVER IS LESS.
 - C: IF THE GRADES SHOWN ON THE SLOPE DETAIL CANNOT BE MET, DEPRESS THE LONGITUDINAL SLOPE OF THE SIDEWALK AT A MAXIMUM RATE OF 5 PERCENT TO MEET THE APRON - APPROACH ELEVATION.

6. USE CLASS AA(AE) CONCRETE FOR SIDEWALK AND DRIVEWAYS
7. USE UNTREATED BASE COURSE UNDER ALL SIDEWALKS AND DRIVEWAYS.
8. 10:1 = 10% SLOPE.
9. QUANTITIES FOR DRIVEWAYS INCLUDE RADIUS AND FLARES T LIP OF GUTTER.

~~UTAH DEPARTMENT OF TRANSPORTATION~~

~~STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION~~

~~SATI LAKSMEY, MITAH~~

RECOMMENDED FOR APPROVAL

~~_____~~
AN STANDING COMMITTEE

~~_____~~
DATE

~~_____~~
JAN.01.2

SIGNED

DATE _____

CONCRETE DRIVEWAYS AND SIDEWALKS

STANDARD DRAWING TITLE

STD DWG
GW 4

Standards Committee Submittal Sheet

Name of preparer: Wes Starkenburg
Title/Position of preparer: Operations Design Engineer
Specification/Drawing/Item Title: SN 4 Flashing Stop Sign
Specification/Drawing Number: SN 4

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

UDOT is changing from wood to steel posts. This would require complete revision of this drawing. The flashing stop sign is not commonly used, because advanced warnings seem to be more effective. The STOP meeting Sept 18, 2007 voted to eliminate this standard drawing rather than redesign.

When required, the flashing stop sign can be shown as design detail. The detail can be designed similar to the more commonly used School Speed Limit Assembly shown on Standard Drawing SN 2

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No change to measurement and payment

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

AGC responded with "no comment"

ACEC Comments: (Use as much space as necessary.)

ACEC responded with "no comment"

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

See attached distribution list

Construction Engineers

See attached distribution list

Contractors (Any additional contacts beyond "C" above.)

Minimal effect on contractors. Contacted AGA only

Suppliers

These changes have no significant effect on suppliers

Consultants (as required) (Any additional contacts beyond “C” above.)

Contacted ACEC only

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

FHWA worked with us while making proposed changes and has been included in this current review.

Others (as appropriate)

None

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

No significant changes to measurement and changes

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

No changes to business systems

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Will be included in publication of next (2008) changes to standards

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

No anticipated changes to bid item price

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

No anticipated changes to operational costs.

3. Life cycle cost.

No anticipated change to lifecycle costs

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.)
(Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Benefits are not having to spend time drafting and updating an infrequently used drawing

- H. Safety Impacts?

No significant impacts to safety.

- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

No recent history

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

Subject: Standard Drawing SN 4 Flashing Stop Sign
 Created By: WSTARKENBURG@utah.gov
 Scheduled Date:
 Creation Date: 9/19/2007 11:29 AM
 From: Wes Starkenburg

Recipient	Action	Date & Time	Comment
To: Anne Ogden (ANNEOGDEN)	Read	9/26/2007 12:05 PM	
To: Anthony Sarhan (anthony.sarhan)	Transferred	9/19/2007 11:29 AM	
CC: Barry Axelrod (BAXELROD)	Read	9/19/2007 11:42 AM	
To: Betty Purdie (BPURDIE)	Read	9/19/2007 1:59 PM	
To: Bill Lawrence (BILLAWRENCE)	Read	9/19/2007 11:56 AM	
To: Boyd Wheeler (BWHEELER)	Read	9/20/2007 2:27 PM	
To: Brent Schvaneveldt (BSCHVANEVELDT)	Read	9/20/2007 12:57 PM	
To: Bret Sorenson (BSORENSEN)	Read	9/21/2007 12:19 PM	
To: Carrie Jacobson (CJACOBSON)	Delivered	9/19/2007 11:29 AM	
To: Clark Mackay (CLARKMACKAY)	Read	9/19/2007 4:08 PM	
To: Danielle Herscher (DANIELLEHERRSCHER)	Read	9/20/2007 8:25 AM	
To: Darin Duersch (DDUERSCH)	Delivered	9/19/2007 11:29 AM	
To: Darren Rosenstein (DROSENSTEIN)	Read	9/20/2007 8:23 AM	
To: Dave Kinnecom (DKINNECOM)	Read	9/19/2007 2:10 PM	
To: Dennis Simper (DENNISSIMPER)	Delivered	9/19/2007 11:29 AM	
To: Deryl Mayhew (DMAYHEW)	Delivered	9/19/2007 11:29 AM	
To: Doug Bassett (DBASSETT)	Read	9/19/2007 4:48 PM	
To: Eric Rasband (ERASBAND)	Read	9/19/2007 11:57 AM	
To: Erik Brondum (EBRONDUM)	Transferred	9/19/2007 11:29 AM	
To: Evan Sullivan (EVANSULLIVAN)	Read	9/27/2007 11:19 AM	
To: Fred Jenkins (FJENKINS)	Read	9/20/2007 5:36 AM	
To: Glen Ames (GLENAMES)	Read	9/19/2007 2:48 PM	
To: Glenn Schulte (GSCHULTE)	Read	9/20/2007 9:14 AM	
To: Greg Searle (GSEARLE)	Read	9/20/2007 1:18 PM	
To: Jack Lyman (JACKLYMAN)	Read	9/20/2007 1:25 PM	
To: Jim Golden (JIMGOLDEN)	Read	10/2/2007 1:33 PM	
To: Joe Kammerer (JKAMMERER)	Read	9/19/2007 11:32 AM	
To: John Leonard (JLEONARD)	Read	9/19/2007 12:03 PM	
To: Josh VanJura (JVANJURA)	Read	9/19/2007 11:42 AM	
To: Kelly Barrett (KBARRETT)	Read	9/19/2007 11:38 AM	
To: Kevin Griffin (KGRIFFIN)	Read	9/19/2007 1:29 PM	
To: Kris Peterson (KRISPETERSON)	Delivered	9/19/2007 11:29 AM	
To: Larry Montoya (LMONTOYA)	Read	9/19/2007 12:07 PM	
To: Lonnie Marchant (LMARCHANT)	Read	9/19/2007 1:23 PM	
To: Lyndon Friant (LFRIANT)	Read	9/19/2007 4:05 PM	
CC: Lynn Bernhard (LYNNBERNHARD)	Delivered	9/19/2007 11:29 AM	
To: Marwan Farah (MFAH)	Read	9/19/2007 11:45 AM	
To: Merrell Jolley (MERRELLJOLLEY)	Delivered	9/19/2007 11:29 AM	
To: Michael Cuthbert (MBCUTHBERT)	Read	9/19/2007 3:41 PM	
To: Michael Kaczorowski (MKACZOROWSKI)	Read	9/26/2007 12:58 PM	
To: Michelle Page (MICHELLEPAGE)	Delivered	9/19/2007 11:29 AM	
To: Mike Donovan (MDONIVAN)	Read	9/19/2007 3:55 PM	
To: Mike Miles (MMILES)	Read	9/26/2007 9:10 AM	
To: Mike Seng (MSENG)	Delivered	9/19/2007 11:29 AM	
To: Mont Wilson (mont.wilson)	Transferred	9/19/2007 11:29 AM	
To: Nathan Lee (NLEE)	Delivered	9/19/2007 11:29 AM	
To: Nathan Merrill (NMERRILL)	Read	9/19/2007 12:58 PM	
To: Nathan Peterson (NATEPETERSON)	Read	9/19/2007 1:17 PM	
To: Nick Peterson (NPETERSON)	Read	9/19/2007 3:00 PM	
To: Randy Park (RPARK)	Read	9/20/2007 8:02 AM	
To: Rex Harris (REXHARRIS)	Delivered	9/19/2007 11:29 AM	
To: Richard Clarke (RICHARDCLARKE)	Read	9/19/2007 11:40 AM	
To: Rick Torgerson (RTORGERSON)	Delivered	9/19/2007 11:29 AM	
To: Rob Clayton (ROBERTCLAYTON)	Read	9/19/2007 1:10 PM	

To: Rob Wight (RWIGHT)	Read	9/19/2007 1:03 PM
To: Robert Hull (RHULL)	Delivered	9/19/2007 11:29 AM
To: Robert Markle (RMARKLE)	Read	9/25/2007 7:26 AM
CC: Robert Miles (ROBERTMILES)	Read	9/19/2007 11:48 AM
To: Robert Westover (RWESTOVER)	Read	9/20/2007 1:40 PM
CC: Roland Stanger (Roland.Stanger)	Transferred	9/19/2007 11:29 AM
To: Rukhsana Lindsey (RLINDSEY)	Delivered	9/19/2007 11:29 AM
To: Russ Tangren (RTANGREN)	Read	9/20/2007 9:10 AM
To: Scott Andrus (SCOTTANDRUS)	Read	9/19/2007 4:25 PM
To: Scott Nussbaum (SNUSSBAUM)	Read	9/19/2007 12:34 PM
To: Stan Burns (SBURNS)	Read	9/20/2007 9:34 AM
To: Steve Ogden (SOGDEN)	Delivered	9/19/2007 11:29 AM
To: Steven Niebergall (SNIEBERGALL)	Read	9/19/2007 11:50 AM
To: Tim Biel (TBIEL)	Read	9/24/2007 12:13 PM
To: Troy Peterson (TLPETERSON)	Read	9/20/2007 7:52 AM
To: Troy Torgersen (TTORGERSEN)	Read	9/23/2007 6:15 PM
To: Tyler Yorgason (tyorgason)	Transferred	9/19/2007 11:29 AM
To: W. Scott Jones (WSJONES)	Read	9/20/2007 5:15 PM
BC: Wes Starkenburg (WSTARKENBURG)	Read	9/19/2007 11:29 AM

Standard Drawing/Specification Review Sheet

Review Comments

Std Dwg/Spec Number	SN 4	Sheet 1	of	1
Date:	9/19/07	Facilitator:	Wes Starkenburg	

1	Roland Stanger	SN 4	OK Response:	A	A
2	Danielle Herrscher	SN 4	No Comment Response:	A	A
3	Brent Schavanevedlt	SN 4	No Comment Response:	A	A
4	Doug Basset	SN 4	No Comment Response:	A	A
5	Fred Jenkins	SN 4	No Comment Response:	A	A
6	John Leonard	SN 4B	Concurs Response:	A	A
7	Mike Miles	SN 4	No Comment Response:	A	A
8	Mont Wilson (AGC)	SN 4	No Comment Response:	A	A
9	Robert Markle	SN 4	No Comment Response:	A	A
10	Robert Weestover	SN 4	No Comment Response:	A	A
11	Tyler Yorgason (ACEC)	SN 4	No Comment Response:	A	A

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standards Committee Submittal Sheet

Name of preparer: Glenn Schulte

Title/Position of preparer: Transportation Safety Specialist

Specification/Drawing/Item Title: SN 8 Ground Mounted Timber Post (P1) &
SN 10 Ground Mounted Square Steel Sign Post(P3)
2005 Std. Dwg.

Specification/Drawing Number: NEW 2008 # SN 8A Temporary Use Ground Mounted
Timber Post
SN 8B Ground Mounted Square Steel Sign Post

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

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(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Based on the request of the Maintenance Divisions these sign are being removed because of maintenance issues of repair when impacted. But base on the relatively low initial cost and the changes in Work Zone Traffic Control they are being maintained as standards for use in the work zone.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

Item will be deleted from the M & P.

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

No comments provided, spoke with Mr. Mont Wilson Sept. 24, concerning the entire package. Expressed no concern for removing these systems as permanent installations.

ACEC Comments: (Use as much space as necessary.)

NO COMMENTS AS OF 10/3/07, confirmed with Tyler Yorgenson receipt of package

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Construction Engineers

No objection were submitted, see review comments form for other submitted comments.

Contractors (Any additional contacts beyond "C" above.)

Chatfield Construction: confirmed package receipt 9/24/07

no comments received 10/3/07

Hikiau Associates: confirmed package receipt 9/24/07 with Mr. Gerald Peterson

no comments received 10/3/07

Interwest Safety: package picked up by Mr. Jim Fowers 9/20/07 no comments received 10/3/07

Intermountain Traffic Safety, Inc. confirmed package receipt 9/24/07 with Mr. Mike Knaras. no comments received 10/3/07

Suppliers

Interwest Safety: package picked up by Mr. Jim Fowers 9/20/07 no comments received 10/3/07

Intermountain Traffic Safety, Inc. confirmed package receipt 9/24/07 with Mr. Mike Knaras. no comments received 10/3/07

Safety Sign & Supply: confirmed package receipt 9/24/07 with Mr. Kelly Matkin no comments received 10/3/07

Consultants (as required) (Any additional contacts beyond "C" above.)

None

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Roland Stanger: meeting 9/27/07, grammatical changes, note numbering

Others (as appropriate)

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

None required

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

Removal of bid item

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Should go into effect when 2008 Standard Drawing & Standard Specification are published for 2008

- F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price. *None*

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).
None, these installations are routinely being upgrade as directed by the Maintenance Division.
 3. Life cycle cost. *NONE*
- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)
- Will be less stock items in the warehouse.
When these systems are impacted a substantial amount of sign panel damage occurs, in a lot of instances the panel is non reusable.*
- H. Safety Impacts?
- Wood Post: None. Systems being replaced with a non-proprietary crash worthy system.
Square Post: None. Systems being replaced with a non-proprietary crash worthy system.*
- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

Standard Drawing/Specification Review Sheet

Review Comments

Std Dwg/Spec Number	SN 8 series SN 9 Series & SN 10 Series	Sheet 1	of	3
Date:		Facilitator:	Glenn Schulte	

Review Comments For

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
1 10/3/2007	Bill Smith Glen Ames Kelly Barreett Kris Peterson Nathan Lee Norton Thurgood Stan Burns Barry Sawasak Bill Lawrence Dave Nazare Joe Kammerer John Higgins John Clarkson Josh VanJura Randy Park Richie Taylor Robert Westover Eric Rasband Kathy Ryan Layne Slack Pat McGann Rick Torgerson Teri Peterson Cory Pope Darin Frstrup David Adamson Larry Montoya Michael Cuthbert Nathan Lee Stan Burns Cameron Kergaye Lori Dabling Phil Huff Richie Taylor Steve Acerson Tommy Vigil Greg Searle Jack Mason Lonnie Marchant Scott Andrus Steve Bonner Dale Stapley Dave Kinnecom Marsha Chaston Russ Tangren		Those listed in reviewer deleted the email with no comments. I can only assume they looked at the material and had no comments.		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet

Review Comments

Std Dwg/Spec Number	SN 8 series SN 9 Series & SN 10 Series	Sheet 2	of	3
Date:		Facilitator:	Glenn Schulte	

Review Comments For

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
1 continued 10/3/2007	Evan Sullivan Darin Frstrup M. Kaczorowski Warren Grames Betty Purdie Jack Lyman Phil Huff Val Stoker Carl Johnson Dal Hawks Dan Webster George Leighton Darly Friant Kim Manwill Lyndon Friant Nancy Jerome		Those listed in reviewer deleted the email with no comments. I can only assume they looked at the material and had no comments.		

2	Brian Phillips		Reviewed with no comments back		
			Response:		

3	Barry Sawsak		No comments		
			Response:		

4	Doug Bassett		No comments praised committee's work		
			Response:		

5	Todd Richin		No comments praised committee's work		
			Response:		

6	Brent Schvaneveldt		No comment		
			Response:		

7	Wes Starkenburg		Grammatical changes		
			Response: made changes		

8	Pat McGann		No comments, Thanked Review Committee		
			Response:		

9	Mike Miles		Looks OK no other comments		
			Response:		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet			Review Comments		
Std Dwg/Spec Number	SN 8 series SN 9 Series & SN 10 Series		Sheet 3	of	3
Date:			Facilitator:	Glenn Schulte	

10	Nathan Peterson		I looked through all of these, no comment, I just don't know enough about signs.		
			Response:		

11	Tim Biel		No comment		
			Response:		

12	Robert Westover		No comments		
			Response:		

13	Robert Markle		No Comments		
			Response:		

14	Fred Jenkins	SN 9B SN 9C	Had a concern about the different measurements being called out on the anchors, miss spelling on 9C		
			Response: explained the difference in the construction of the two anchors. Corrected misspelling		

15	Cris Cowan		Thanked the committee for a good job.		
			Response:		

16	Dave Babcock		Had some concern about the double post application be remove . Thanked committee for the work.		
			Response: Explained the reasoning behind the removal, twisted signs due to wind loading.		

17	Scott Nussbaum		"I'm afraid I'll have to leave the review of these to the rest of the capable bunch."		
			Response:		

18	Mont Wilson		Verbal conversation, appear to be OK		
			Response:		

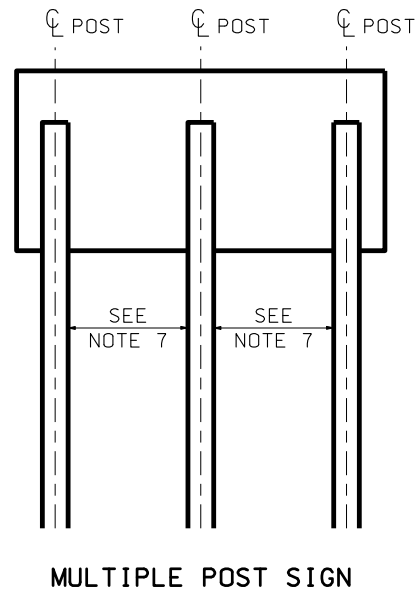
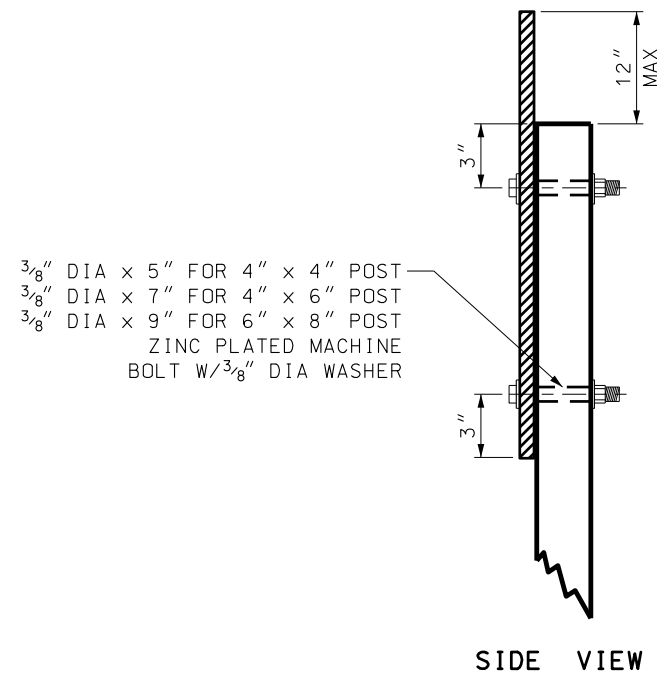
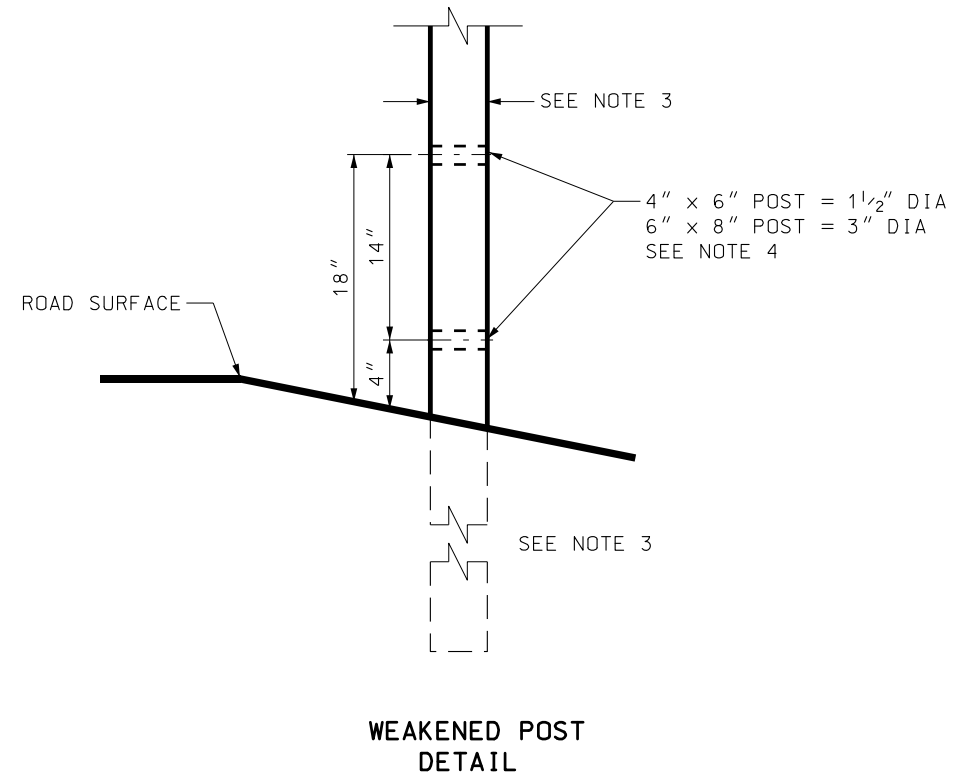
19	Roland Stanger		Had note comments and post requirement comments		
			Response: had a sit down review of comments		

20	Clark Mackay		No comments		
			Response:		

21					
			Response:		

22					
			Response:		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate



TIMBER SIGN POSTS (Nominal)													
HORIZONTAL SIGN DIMENSION (inches)													
VERTICAL SIGN DIMENSION (inches)		12	24	36	48	60	72	84	96	108	120	132	144
	12	1 – 4x4 4	1 – 4x4 4	1 – 4x4 4	1 – 4x4 4	2 – 4x4 4	2 – 4x4 4	2 – 4x4 4	2 – 4x4 4	2 – 4x4 4	2 – 4x4 4	2 – 4x4 4	2 – 4x4 4
	18	1 – 4x4 4	1 – 4x4 4	1 – 4x4 4	1– 4x6 4	2 – 4x4 4	2 – 4x4 4	2 – 4x4 4	2 – 4x6 4	2 – 4x6 4	2 – 4x6 4	2 – 4x6 4	2 – 4x6 4
	24	1 – 4x4 4	1 – 4x4 4	1– 4x6 4	1– 4x6 4	2 – 4x4 4	2 – 4x6 4	2 – 4x6 4	2 – 4x6 4	2 – 4x6 4	2 – 4x6 4	2 – 4x6 4	2 – 4x6 4
	30	1 – 4x4 4	1 – 4x4 4	1– 4x6 4	1– 4x6 4	2 – 4x6 4	2 – 4x6 4	2 – 4x6 4	2 – 4x6 4	2 – 4x6 4	2 – 4x6 4	3 – 4x6 4	3 – 4x6 4
	36	1 – 4x4 4	1– 4x6 4	1– 4x6 4	1– 4x6 4	2 – 4x6 4	2 – 4x6 4	2 – 4x6 4	2 – 4x6 4	3 – 4x6 4	3 – 4x6 4	3 – 4x6 4	3 – 4x6 4
	42	1 – 4x4 4	1– 4x6 4	1– 4x6 4	1– 4x6 4	2 – 4x6 4	2 – 4x6 4	2 – 4x6 4	3 – 4x6 4	3 – 4x6 4	3 – 4x6 4	2 – 6x8 5	2 – 6x8 5
	48	1 – 4x4 4	1– 4x6 4	1– 4x6 4	2 – 4x6 4	2 – 4x6 4	2 – 4x6 4		3 – 4x6 4	3 – 4x6 4	2 – 6x8 4	2 – 6x8 5	2 – 6x8 5
	54	1 – 4x4 4	1– 4x6 4	1– 6x8 5	2 – 4x6 4	2 – 4x6 4	1– 6x8 5		2 – 6x8 5	2 – 6x8 5	2 – 6x8 5	2 – 6x8 5	2 – 6x8 5
	60	1– 4x6 4	1– 4x6 4	1– 6x8 5	2 – 4x6 4	1– 6x8 5	1– 6x8 5		2 – 6x8 5	2 – 6x8 5	2 – 6x8 5	2 – 6x8 5	2 – 6x8 5
66	1– 4x6 4	1– 4x6 4	1– 6x8 5	2 – 4x6 4	1– 6x8 5			2 – 6x8 5	2 – 6x8 5	2 – 6x8 5	2 – 6x8 5		
72	1– 4x6 4	1– 6x8 5	1– 6x8 5	1– 6x8 5	1– 6x8 5				2 – 6x8 5	2 – 6x8 5	2 – 6x8 5		

LEGEND

2 - 4x6	NUMBER & SIZE (inch x inch) OF POSTS
5	EMBODMENT DEPTH IN FEET

NOTES:

1. USE PERMITTED IN WORK ZONES.
 - a. INSTALL AFTER NOTICE TO PROCEED IS GIVEN.
 - b. REMOVE WHEN DIRECTED BY ENGINEER.
2. USE PERMITTED BY MAINTENANCE IN EMERGENCY SITUATIONS.
 - a. USE FOR A MAXIMUM 90 DAYS.
3. NARROW POST DIMENSION TO FACE TRAFFIC.
4. USE ONE 4" x 6" POST FOR MULTIPLE SIGN INSTALLATION ON SINGLE POST, EXCLUDING ROUTE MARKERS.
5. MINIMUM DEPTH OF EMBEDMENT: 4' UNLESS 5' IS SHOWN.
6. FIELD DRILL TWO HOLES IN THE CENTER OF THE POST.
DRILL PERPENDICULAR TO THE CENTER LINE OF THE ROAD.
7. MINIMUM SPACING BETWEEN POST:

POST SIZE	SPACING
FOR 3 OR MORE POSTS	4" x 4" = 4'
FOR 3 OR MORE POSTS	4" x 6" = 4'
FOR 2 OR MORE POSTS	6" x 8" = 7'
8. REFER TO STD DWG SN 7 SERIES FOR PLACEMENT OF GROUND MOUNTED SIGNS.
9. MEET STD SPEC SECTION 06055 TIMBER AND TIMBER TREATMENT.

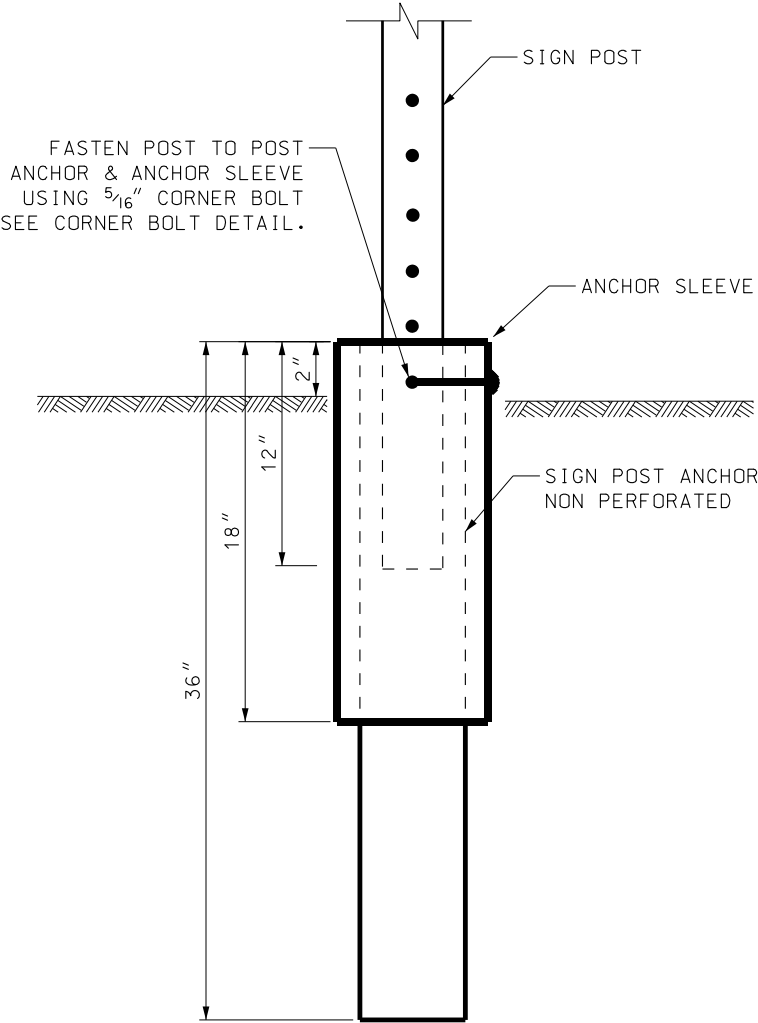
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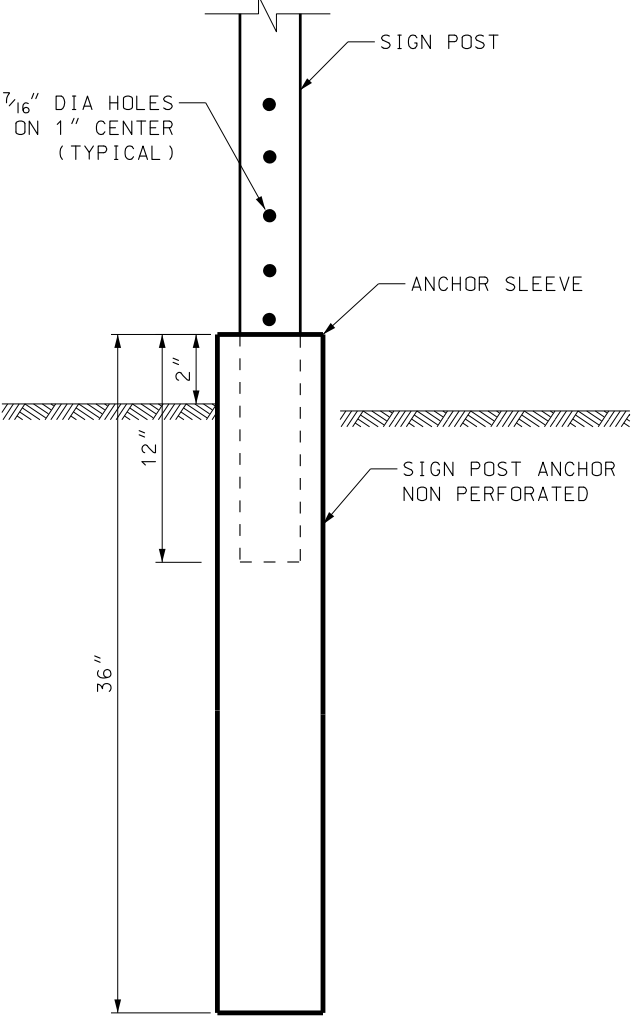
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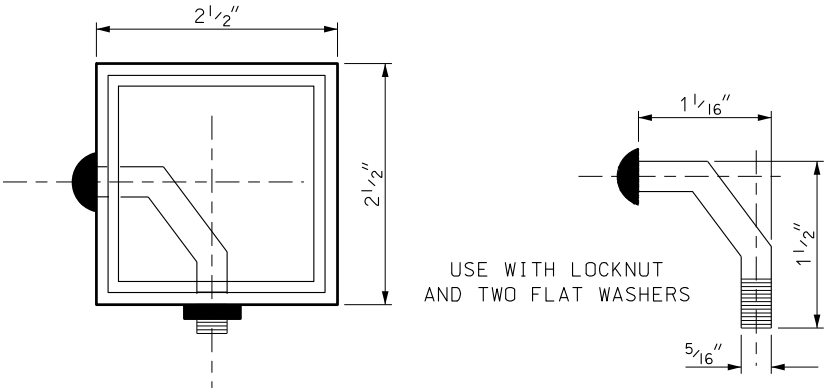
SIGN INSTALLATION



TYPICAL INSTALLATION ,
HIGH IMPACT AREAS
(TWO PIECE BREAKAWAY ANCHOR)



TYPICAL INSTALLATION
(W/ONE PIECE BREAKAWAY ANCHOR)



CORNER BOLT DETAIL

SQUARE STEEL SIGN POSTS												
VERTICAL SIGN DIMENSION (inches)	HORIZONTAL SIGN DIMENSION (inches)											
	12	24	36	48	60	72	84	96	108	120	132	144
	12	1 T1	1 T1	1 T1	1 T1	2 T1	2 T1	2 T1	2 T1	2 T1	2 T1	2 T1
	18	1 T1	1 T1	1 T1	1 T1	2 T1	2 T1	2 T1	2 T1	2 T1	2 T1	2 T2
	24	1 T1	1 T1	1 T1	1 T1	2 T1	2 T1	2 T1	2 T2	2 T2	2 T2	2 T2
	30	1 T1	1 T1	1 T2	2 T1	2 T1	2 T1	2 T2	2 T2	2 T2	2 T2	
	36	1 T1	1 T1	1 T2	2 T1	2 T1	2 T2	2 T2	2 T2			
	42	1 T1	1 T2	1 T2	2 T1	2 T2	2 T2	2 T2				
	48	1 T1	1 T2	2 T1	2 T2	2 T2	2 T2					
	54	1 T1	1 T2	2 T2	2 T2	2 T2						
	60	1 T1	1 T2	2 T2	2 T2							
	66	1 T1	1 T2	2 T2								
	72	1 T1	1 T2	2 T2								

T1 = 2" 12 GAUGE W/2 1/4" ANCHOR, 2 1/2" SLEEVE
T2 = 2 1/2" 12 GAUGE W/3/4" ANCHOR, 3" SLEEVE

NOTES:

- USE PERMITTED IN WORK ZONES.
 - INSTALL AFTER NOTICE TO PROCEED IS GIVEN.
 - REMOVE WHEN DIRECTED BY ENGINEER.
- USE PERMITTED BY MAINTENANCE IN EMERGENCY SITUATIONS.
 - USE FOR A MAXIMUM 90 DAYS.
- DO NOT USE IN WEAK SOIL.
 - USE TRIANGULAR STEEL ANCHOR, STD DWG SN 9B, BASE B2A AS DESCRIBED IN NOTES 1 AND 2.
 - MEET POST REQUIREMENTS AS PER STD DWG SN 9B.
- REFER TO STD DWG SN 7 SERIES FOR PLACEMENT OF GROUND MOUNTED SIGNS.

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

RECOMMENDED FOR APPROVAL
CHAIRMAN STANDARDS COMMITTEE
APPROVED
DEPUTY DIRECTOR
JAN 01 2008
DATE
JAN 01 2008
DATE

TEMPORARY USE
GROUND MOUNTED
SQUARE STEEL
SIGN POST

STANDARD DRAWING TITLE

STD DWG
SN 8B

Standards Committee Submittal Sheet

Name of preparer: Glenn Schulte
Title/Position of preparer: Transportation Safety Specialist
Specification/Drawing/Item Title: SN 9 Ground Mounted Tubular Steel Sign Post (P2)
Specification/Drawing Number: NEW 2008 # SN 9 Series
SN 9A Small Sign Tubular Steel Post Base (B1)
SN 9B Small Sign Tubular Steel Post Base (B2A)
SN 9C Small Sign Tubular Steel Post Base (B2B)

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

The current drawing(SN 9) mixed 2 proprietary systems on one sheet. It was hard for designers, construction and maintenance to determine which system to call out, construct and to maintain. Post sizes were not clearly defined or the size of sign that could be mounted was confusing to all.

SN 9A Small Sign Tubular Steel Post Base (B1): *This is a proprietary system. Defined post size requirements and sign size requirements. Base on field experience and comments from maintenance the foundation was increased. Notes identify additional the sign sizes and mounting requirements. Base manufacturer determined sign size for a particular post and is base on wind loading. A margin was sufficient that a supplemental sign could be added based on surface area. See Note 4. Directs installer and maintenance worker to proper attachment of sign panel.*

SN 9B Small Sign Tubular Steel Post Base (B2A): *This is a proprietary system. It is also a driven system. Defined post size requirements and sign size requirements. Directs*

installer and maintenance worker to proper attachment of sign panel. Notes identify additional the sign sizes and mounting requirements. Base manufacturer determined sign size for a particular post and is based on wind loading. A margin was sufficient that a supplemental sign could be added based on surface area. See Note 4. Defined the proper orientation of base, not previously identified.

SN 9C Small Sign Tubular Steel Post Base with Concrete (B2B): *This is an addition to the current standards and is a proprietary system. Is being added as alternative to Gives direction for the installation with concrete. This is an alternative SN 9A Small Sign Tubular Steel Post Base (B1) and the standard described in SN 9B Small Sign Tubular Steel Post Base (B2A). Defined post size requirements and sign size requirements. Directs installer and maintenance worker to proper attachment of sign panel. Notes identify additional the sign sizes and mounting requirements. Base manufacturer determined sign size for a particular post and is based on wind loading. A margin was sufficient that a supplemental sign could be added based on surface area. See Note 4. Defined the proper orientation of base, not previously identified.*

The designation P2 has been changed to B1, B2A or B2B, it was felt by the committee the current designation was describing a post type and not a base and was confusing to not only Maintenance but to contractors and suppliers. This sentiment was also express by several vendors in the past.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

New M & P item defined.

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)
Mr. Mont Smith, verbal conversation , had no issues.

ACEC Comments: (Use as much space as necessary.)
No comments received as of 10/03/07

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Construction Engineers

Minimal response, no great concerns expressed

Contractors (Any additional contacts beyond “C” above.)

No responses as of 10/03/07

Suppliers

No responses as of 10/03/07

Consultants (as required) (Any additional contacts beyond “C” above.)

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Roland Stanger: technical issues and grammatical changes addressed.

Others (as appropriate)

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)
2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)
3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.
Due to the current system of paying for signs cost for posts and bases is not available. Cost would be realized from the installation of a more appropriate sign post and base
2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).
Should have little effect
3. Life cycle cost.

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)
Due to the current system of paying for signs a cost benefit was not obtained. Anecdotal information and site observations by this observer suggest that low cost sign panels are being installed with high-end posts and bases, which are obviously costing more than is required for the sign panel. Use of these systems may decrease the amount of sign damage that occurs upon impact. With these system more clear identified the designer will not be calling out sign bases and post that cost substantially more that what is require for the sign panel.

H. Safety Impacts?

None, all system have been crash tested to NCHRP 350 requirements.

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Many sign panels have been installed using a heavier post, usually SCH 80 and base, usually a slipbase system when a lighter less expensive post and base is just as efficient and can handle the loading.

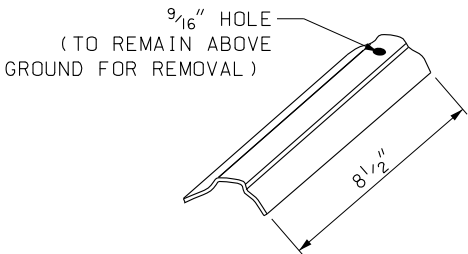
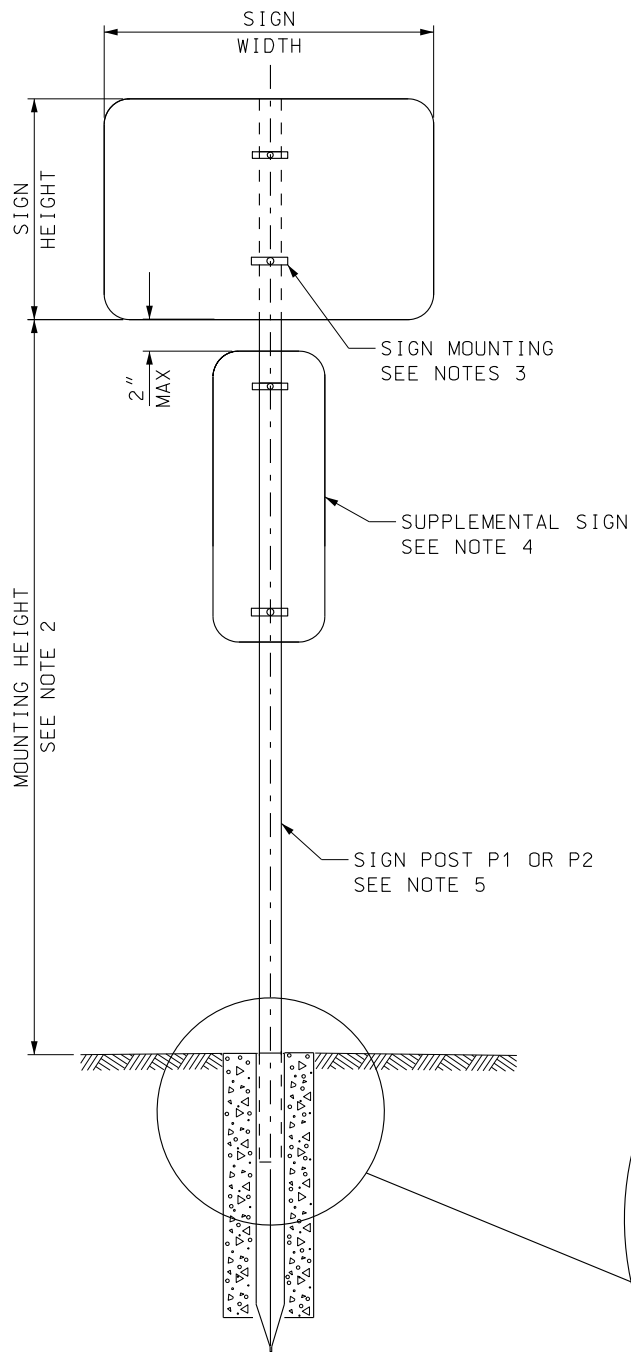
Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

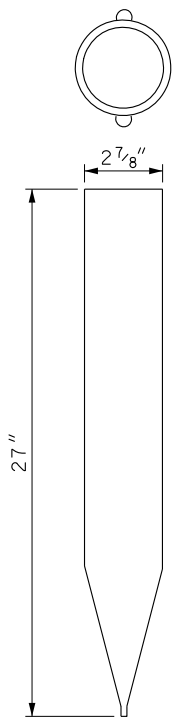
- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

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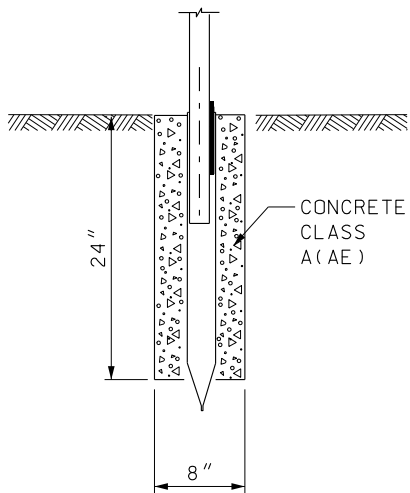
SMALL SIGN TUBULAR STEEL POST BASE (B1)
(SOCKET SYSTEM)
(SINGLE POST APPLICATION ONLY)



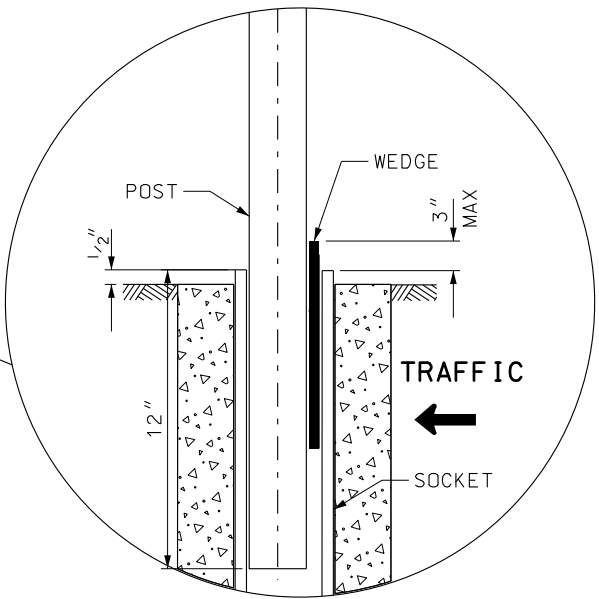
WEDGE
11 GA. GALVANIZED
STEEL ASTM 526 G-90



TUBULAR SOCKET
12 GA. GALVANIZED
STEEL ASTM 787



CONCRETE FOUNDATION
SEE NOTE 1



NOTE:
INSTALL WEDGE ON APPROACH
TRAFFIC SIDE OF POST

POST SELECTION GUIDE *

SIGN HEIGHT (FT.)	SIGN WIDTH (FT.)				
	1	2	2.5	3	
1	P1	P1	P1	P1	
2	P1	P1	P1	P1	
2.5	P1	P1	P1	P1	
3	P1	P1	P1	P2	
4	P1	P1	P2	P2	

* POST SELECTION GUIDE
ASSUMES A 7' MOUNTING
HEIGHT FROM BOTTOM OF SIGN.
INCREASE POST ONE SIZE
FOR ADDITIONAL FOOT OF
MOUNTING HEIGHT. MAXIMUM
MOUNTING HEIGHT 8 FEET.
IF MOUNTING HEIGHT
REQUIREMENTS ARE GREATER,
ANOTHER SIGN BASE OPTION
IS REQUIRED.

POST SIZE AND SIGN SIZE DETERMINED BY BASE
MANUFACTURER'S WIND LOADING REQUIREMENTS.

POST DETAIL CHART
(SINGLE POST ONLY)

POST TYPE	OUTSIDE DIAMETER	WALL THICKNESS (GAUGE)	MATERIAL AND COATING REQUIREMENTS
P1 #	2 3/8"	0.080" (14 GAUGE)	ASTM-513 GALVANIZED TO MEET ASTM A-653-G90
P2 #	2 3/8"	0.095" (13 GAUGE)	ASTM-513 GALVANIZED TO MEET ASTM A-653-G90

DO NOT USE "T" OR "U" BRACKET ON P1 OR P2 POSTS.

NOTES:

1. CONCRETE FOUNDATION REQUIRED IN ALL INSTALLATIONS.
2. REFER TO STD DWG SN 7 FOR MOUNTING HEIGHT AND OFFSET REQUIREMENTS.
3. REFER TO STD DWG SN 10B FOR SIGN MOUNTING REQUIREMENTS.
4. WHEN INSTALLING A SUPPLEMENTAL SIGN DO NOT EXCEED MAXIMUM SQUARE FOOTAGE OF POST BY MORE THAN 25%. (EX: POST P2 MAX, SIGN SIZE 3'W x 4'H=12 SQ.FT. + 25%=15 SQ.FT.=(3'W x 4'H)+(1'W x 3'H)=15).
5. USE OF YELLOW POSTS FOR LEFT SIDE (MEDIAN) INSTALLATION OR FOR LOCATIONS WITH A HIGH PROBABILITY OF BEING IMPACTED IS PERMITTED WHEN APPROVED BY REGION TRAFFIC ENGINEER.

POST NOTES:

POSTS PRE-PUNCHED WITH 3/8" HOLES,
MOUNT SIGN DIRECTLY TO POST OR USE AN
APPROVED MOUNTING CLAMP. SPACING OF HOLES
FROM TOP IN INCHES ARE AS FOLLOWS:

1", 3", 10", 16", 21", 23", 24", 27", 33", 37", 39" AND 45"

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

RECOMMENDED FOR APPROVAL

CHAIRMAN STANDARDS COMMITTEE

APPROVED

DEPUTY DIRECTOR

SMALL SIGN
TUBULAR STEEL
POST BASE WITH
CONCRETE (B1)

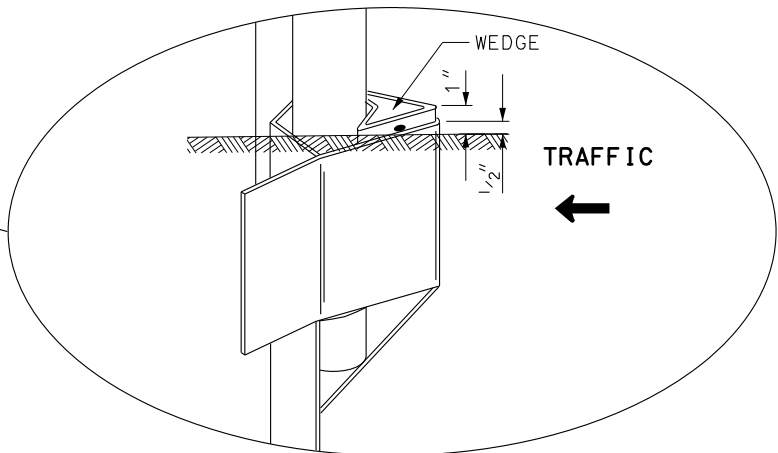
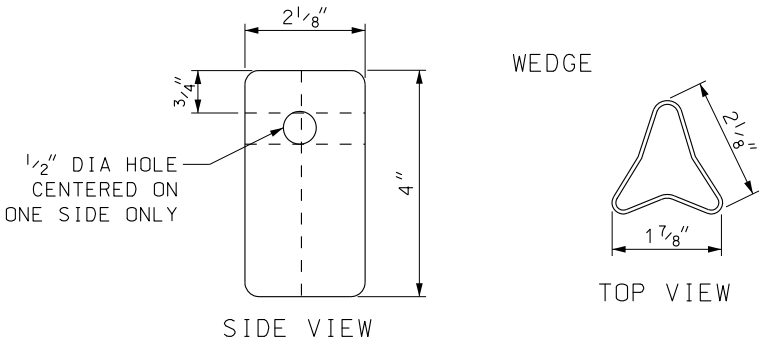
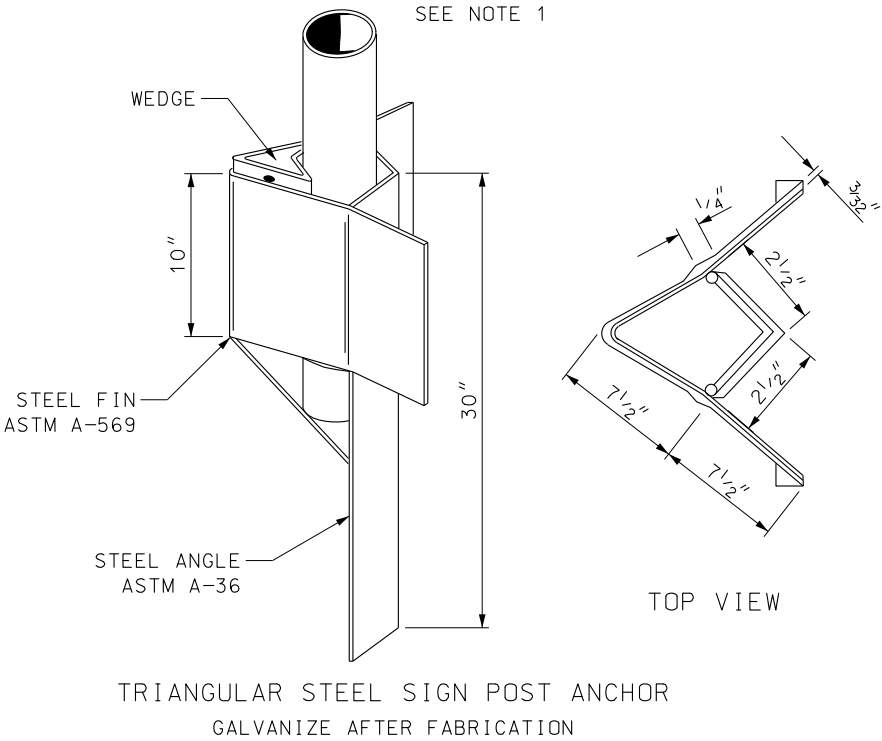
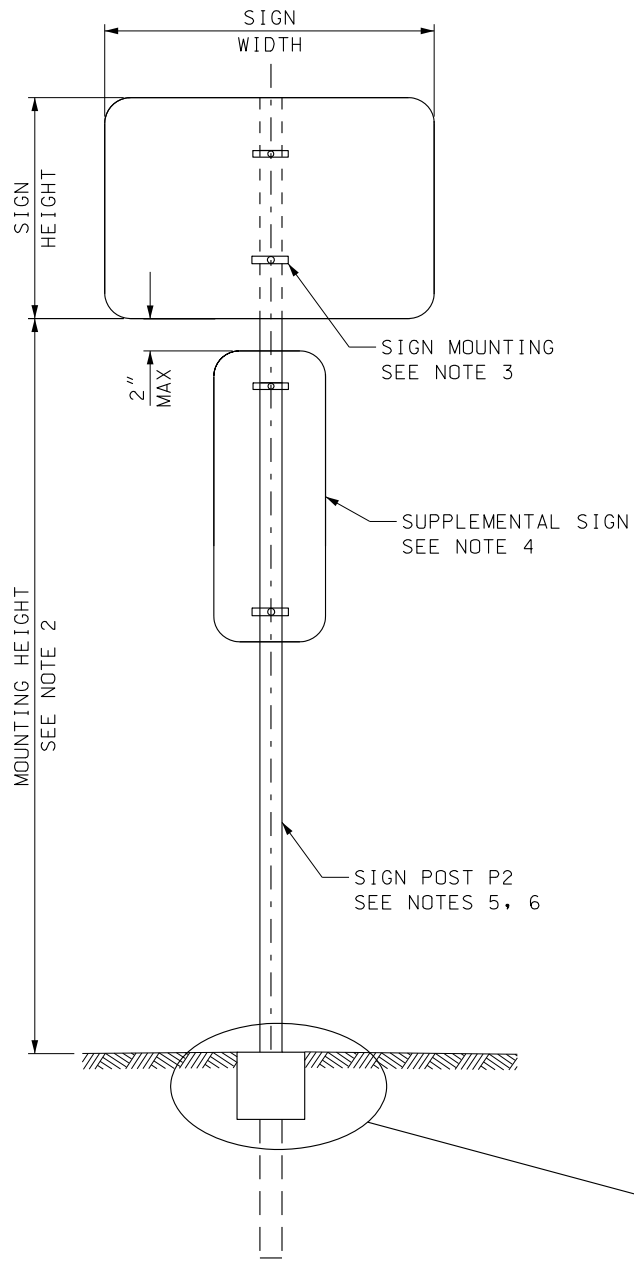
STANDARD DRAWING TITLE

STD DWG
SN 9A

DRAFT

SMALL SIGN TUBULAR STEEL POST BASE (B2A)
(TRIANGULAR STEEL ANCHOR SYSTEM)
(SINGLE POST APPLICATION ONLY)

SEE NOTE 1



DRIVE ANCHOR INSTALLATION NOTES:

1. DRIVE POST ANCHOR FLUSH WITH GROUND LINE. ORIENT ANCHOR SO WEDGE INSTALLATION IS TOWARD APPROACH TRAFFIC.
2. INSTALL WEDGE WITH 1" MAX EXPOSURE TO TOP OF ANCHOR.

POST SELECTION GUIDE *

SIGN HEIGHT (FT.)	SIGN WIDTH (FT.)			
	1	2	2.5	3
1	P2	P2	P2	P2
2	P2	P2	P2	P2
2.5	P2	P2	P2	P2
3	P2	P2	P2	
4	P2	P2		

* POST SELECTION GUIDE ASSUMES A 7' MOUNTING HEIGHT FROM BOTTOM OF SIGN. MAXIMUM MOUNTING HEIGHT 8 FEET. IF MOUNTING HEIGHT REQUIREMENTS ARE GREATER, ANOTHER SIGN BASE OPTION IS REQUIRED.

POST SIZE AND SIGN SIZE DETERMINED BY BASE MANUFACTURER'S WIND LOADING REQUIREMENTS.

POST DETAIL CHART
(SINGLE POST ONLY)

POST TYPE	OUTSIDE DIAMETER	WALL THICKNESS (GAUGE)	MATERIAL AND COATING REQUIREMENTS
P2	2 3/8"	0.095" (13 GAUGE)	ASTM-513 GALVANIZED TO MEET ASTM A-653-G90
DO NOT USE "T" OR "U" BRACKET			

NOTES:

1. USE TRIANGULAR POST ANCHOR IN STRONG SOILS ONLY. USE STD DWG SN 9A, BASE B1 WHEN WEAK SOILS ARE ENCOUNTERED.
2. REFER TO STD DWG SN 7 FOR MOUNTING HEIGHT AND OFFSET REQUIREMENTS.
3. REFER TO STD DWG SN 10B FOR SIGN MOUNTING REQUIREMENTS.
4. WHEN INSTALLING A SUPPLEMENTAL SIGN DO NOT EXCEED MAXIMUM SQUARE FOOTAGE OF POST BY MORE THAN 25%. (EX: POST P2 MAX. SIGN SIZE 2'W x 4'H=8 SQ.FT. + 25%=10 SQ.FT.=(2'W x 4'H)+(1'W x 2'H)=10).
5. DO NOT USE "T" OR "U" BRACKET WITH THIS SIGN BASE.
6. USE OF YELLOW POSTS FOR LEFT SIDE (MEDIAN) INSTALLATION OR FOR LOCATIONS WITH A HIGH PROBABILITY OF BEING IMPACTED IS PERMITTED WHEN APPROVED BY REGION TRAFFIC ENGINEER.

POST NOTES:

POSTS PRE-PUNCHED WITH 3/8" HOLES, MOUNT SIGN DIRECTLY TO POST OR USE AN APPROVED MOUNTING CLAMP. SPACING OF HOLES FROM TOP IN INCHES ARE AS FOLLOWS:

1", 3", 10", 16", 21", 23", 24", 27", 33", 37", 39" AND 45"

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

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APPROVED

DEPUTY DIRECTOR

SMALL SIGN
TUBULAR STEEL
POST BASE (B2A)

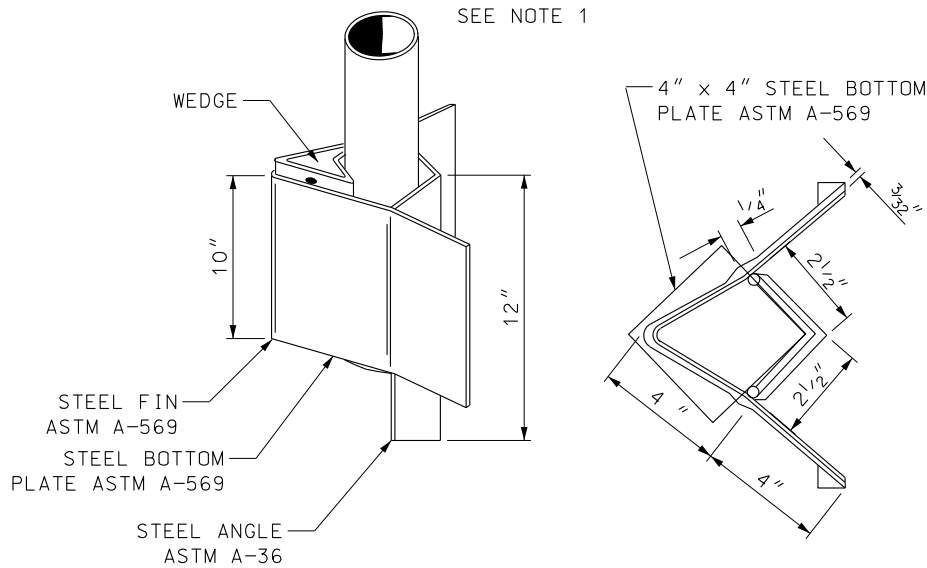
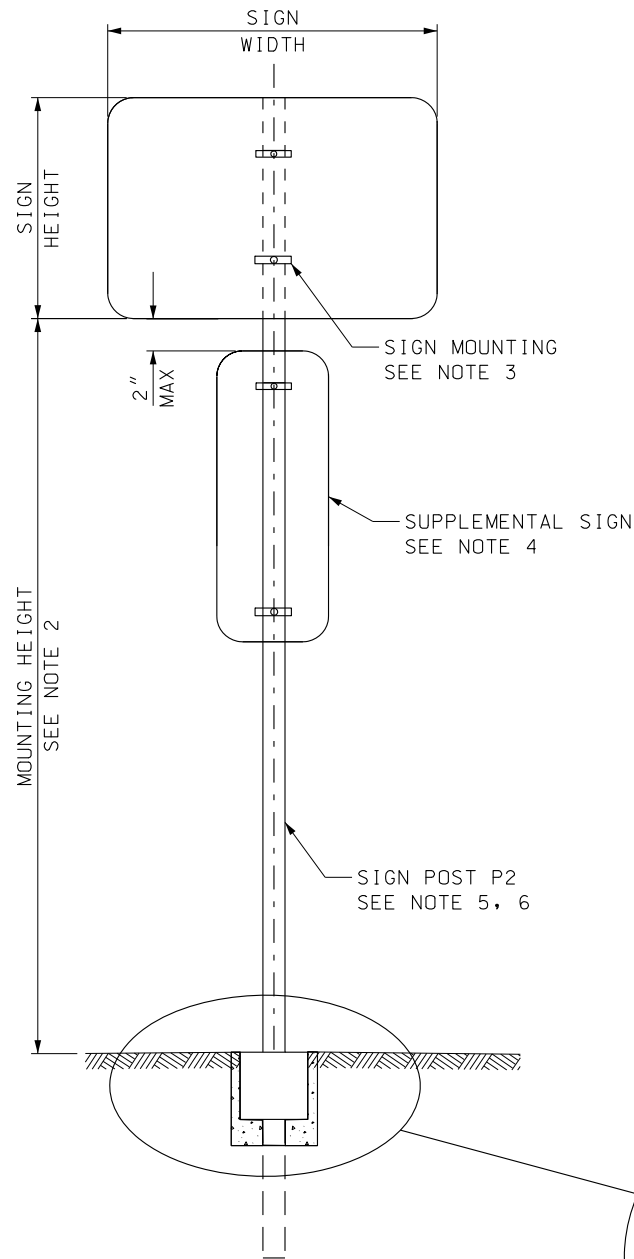
STANDARD DRAWING TITLE

STD DWG
SN 9B

DRAFT

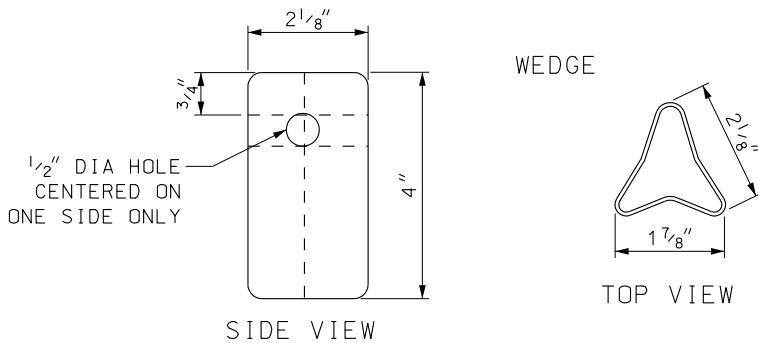
SMALL SIGN TUBULAR STEEL POST BASE FOR CONCRETE (B2B)
(TRIANGULAR STEEL ANCHOR SYSTEM IN CONCRETE)
(SINGLE POST APPLICATION ONLY)

SEE NOTE 1



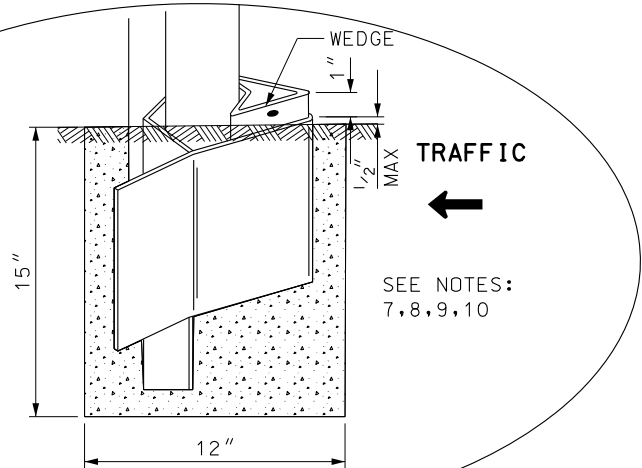
TOP VIEW

TRIANGULAR STEEL SIGN POST ANCHOR
GALVANIZE AFTER FABRICATION



TOP VIEW

SIDE VIEW



POST SELECTION GUIDE *

SIGN HEIGHT (FT.)	SIGN WIDTH (FT.)			
	1	2	2.5	3
1	P2	P2	P2	P2
2	P2	P2	P2	P2
2.5	P2	P2	P2	P2
3	P2	P2	P2	
4	P2	P2		

* POST SELECTION GUIDE ASSUMES A 7' MOUNTING HEIGHT FROM BOTTOM OF SIGN. MAXIMUM MOUNTING HEIGHT 8 FEET. IF MOUNTING HEIGHT REQUIREMENTS ARE GREATER, ANOTHER SIGN BASE OPTION IS REQUIRED.

POST SIZE AND SIGN SIZE DETERMINED BY BASE MANUFACTURER'S WIND LOADING REQUIREMENTS.

POST DETAIL CHART
(SINGLE POST ONLY)

POST TYPE	OUTSIDE DIAMETER	WALL THICKNESS (GAUGE)	MATERIAL AND COATING REQUIREMENTS
P2	2 3/8"	0.095" (13 GAUGE)	ASTM-513 GALVANIZED TO MEET ASTM A-653-G90

DO NOT USE "T" OR "U" BRACKET

NOTES:

1. USE TRIANGULAR ANCHOR FOR CONCRETE WHEN WEAK SOILS ARE ENCOUNTERED OR WHEN PLACED IN CONJUNCTION WITH AN ISLAND OR SIDEWALK.
2. REFER TO STD DWG SN 7 FOR MOUNTING HEIGHT AND OFFSET REQUIREMENTS.
3. REFER TO STD DWG SN 10B FOR SIGN MOUNTING REQUIREMENTS.
4. WHEN INSTALLING A SUPPLEMENTAL SIGN DO NOT EXCEED MAXIMUM SQUARE FOOTAGE OF POST BY MORE THAN 25%. (EX: POST P2 MAX. SIGN SIZE 2'W x 4'H=8 SQ.FT.+ 25%=10 SQ.FT.=(2'W x 4'H)+(1'W x 2'H)=10).
5. DO NOT USE "T" OR "U" BRACKET WITH THIS SIGN BASE.
6. USE OF YELLOW POSTS FOR LEFT SIDE (MEDIAN) INSTALLATION OR FOR LOCATIONS WITH A HIGH PROBABILITY OF BEING IMPACTED IS PERMITTED WHEN APPROVED BY REGION TRAFFIC ENGINEER.
7. INSTALL ANCHOR FOUNDATION AT TOP OF FINISHED GRADE. DO NOT INSTALL ANCHOR PRIOR TO COMPLETION OF FINISHED GRADE..
8. INSTALL ON ISLAND OR SIDEWALK WHEN FINISHED SURFACE IS COMPLETED. CORE DRILLING OF ISLAND OR SIDEWALK REQUIRED..
9. PLACE FOUNDATION AND POST ANCHOR FLUSH WITH FINISHED SURFACE.
10. FINISH WEDGE 1" MAX ABOVE TOP OF ANCHOR.

POST NOTES:

POSTS PRE-PUNCHED WITH 3/8" HOLES, MOUNT SIGN DIRECTLY TO POST OR USE AN APPROVED MOUNTING CLAMP. SPACING OF HOLES FROM TOP IN INCHES ARE AS FOLLOWS:

1", 3", 10", 16", 21", 23", 24", 27", 33", 37", 39" AND 45"

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

RECOMMENDED FOR APPROVAL

CHAIRMAN STANDARDS COMMITTEE

APPROVED

DEPUTY DIRECTOR

SMALL SIGN
TUBULAR STEEL
POST BASE WITH
CONCRETE (B2B)

STANDARD DRAWING TITLE

STD DWG
SN 9C

Standards Committee Submittal Sheet

Name of preparer: Glenn Schulte
Title/Position of preparer: Transportation Safety Specialist
Specification/Drawing/Item Title: SN 11 Slipbase Ground Mounted Tubular Steel Sign Post(P4)
Specification/Drawing Number: NEW 2008 # SN 10 Series
SN 10A Slipbase Sign Base (B3) Hardware
SN 10B Slipbase Sign Base (B3) Installation

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

The current drawing (SN 11) this drawing had a lot of information and was hard for maintenance, construction and design to determine the correct application and installation. The drawing was split into two drawings SN 10A detailing hardware requirements and assembly. SN 10B details sign size and installation requirements.

This system was thought to be a proprietary system and could only be supplied by one source, the following letter was found showing this is not a proprietary system. The letters contents were confirmed and are still effective, confirmation was from Mr. Larry Peak, Northwest Pipe, Houston, Texas.



U.S. Department
Of Transportation
**Federal Highway
Administration**

400 Seventh St., S.W.
Washington, D.C. 20590

December 3, 1997

Refer to: HNG-14/SS-65B

Philip C. Lewis, P.E.
Southwestern Pipe, Inc.
P.O. Box 2002
Houston, Texas 77252-2002

Dear Mr. Lewis:

This is in reference to our acceptance letter SS-65A dated June 20, 1997, regarding the POZ-LOC Slip base System and the POZ-LOC Yielding Anchor System. Your letter of July 16, 1997, requested that we remove the reference to proprietary materials, because the drawings are public information and anyone can make the same system.

With this letter, numbered SS-65B, we wish to reiterate that the POZ-LOC slip base and POZ-LOC yielding anchor systems are acceptable for use on the National Highway System when requested by a State and state that they are not subject to the requirements associated with proprietary products.

We apologize for any inconvenience this erroneous reference may have caused.

Sincerely yours,

Dwight A. Horne
Chief, Federal Aid and Design Division

Federal Highway Administration
HNG-14:Nartimovich;gm:366-1331;gmorton:11-24-97:LEWIS
Copies to:
HNG-1 HNG-10 HNG-14 Reader, 3128 File, 3128
Ras HFL-1 HHS-1 HRS-1 HNG-20

Geometric and Roadside Design Acceptance Letter SS-65B

SN 10A Slipbase Sign Base (B3) Hardware

The developers of this system introduced a new top casting, using set screws, which was being supplied and installed but not detailed on our drawing. Maintenance believes the new casting is beneficial and should be allowed as a standard. They also felt the slip ring cast should be used as directed in the drawings. SN 10A details both casting, SLB-1 is the lock ring casting and SLB-2 is the set screw casting. The typical assembly detail was revised to reflect this change, a Locking Collar Installation detail was added based on field experience, the locking collar was not being installed properly and allowed the post to rock inside the casting. A Post Detail Chart was added detailing the acceptable posts.

SN 10A Slipbase Sign Base (B3) Installation

The previous drawing was very vague on installation requirements, this drawing detail installation in island, sidewalk and soil (ground) applications. Additional guides were added to give the user appropriate information of which post to use based on sign size.

The designation P4 has been changed to B3, it was felt by the committee the current designation was describing a post type and not a base and was confusing to not only Maintenance but to contractors and suppliers. This sentiment has also been express by several vendors in the past.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

*New M & P item will have to be defined.
Standard Specification 02891 will be modified.*

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

No comments provided, spoke with Mr. Mont Wilson Sept. 24, concerning the entire package. Expressed no concern.

ACEC Comments: (Use as much space as necessary.)

NO COMMENTS AS OF 10/3/07, confirmed with Tyler Yorgenson receipt of package

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)
Construction Engineers

Contractors (Any additional contacts beyond "C" above.)

Chatfield Construction: confirmed package receipt 9/24/07

no comments received 10/3/07

Hikiau Associates: confirmed package receipt 9/24/07 with Mr. Gerald Peterson

no comments received 10/3/07

Interwest Safety: package picked up by Mr. Jim Fowers 9/20/07 no comments received 9/27/07

Intermountain Traffic Safety, Inc. confirmed package receipt 9/24/07 with Mr. Mike Knaras. no comments received 10/3/07

Suppliers

Interwest Safety: package picked up by Mr. Jim Fowers 9/20/07 no comments received 10/3/07

Intermountain Traffic Safety, Inc. confirmed package receipt 9/24/07 with Mr. Mike Knaras. no comments received 10/3/07

Safety Sign & Supply: confirmed package receipt 9/24/07 with Mr. Kelly Matkin no comments received 10/3/07

Consultants (as required) (Any additional contacts beyond "C" above.)
None

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Roland Stanger: meeting 9/27/07, grammatical changes, note numbering, SLB -1 and SLB-2 verbiage under title, change 4 x4 to 16 sq. feet. Change will be directed by square footage instead of width & height.

Others (as appropriate)

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)
2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)
3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.
Due to the current system of paying for signs cost for posts and bases is not available. Cost would be realized from the installation of a more appropriate sign post and base
2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).
Should have little effect
3. Life cycle cost.

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)
Due to the current system of paying for signs a cost benefit was not obtained. Anecdotal information and site observations by this observer suggest that low cost sign panels are being installed with high-end posts and bases, which are obviously costing more than is required for the sign panel. Use of these systems may decrease the amount of sign damage that occurs upon impact. With these system more clear identified the designer will not be calling out sign bases and post that cost substantially more that what is require for the sign panel.

H. Safety Impacts?

None, all system have been crash tested to NCHRP 350 requirements.

- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Many sign panels have been installed using a heavier post, usually SCH 80 and base, usually a slipbase system when a lighter less expensive post and base is just as efficient and can handle the loading.

Priority Explanation

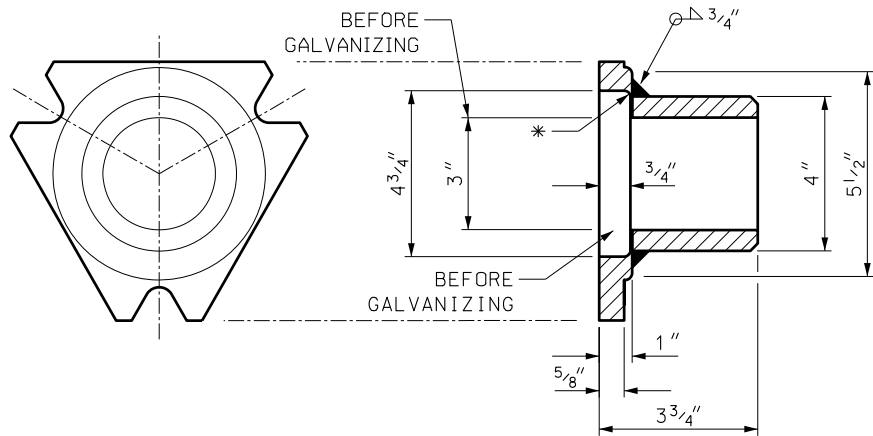
Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

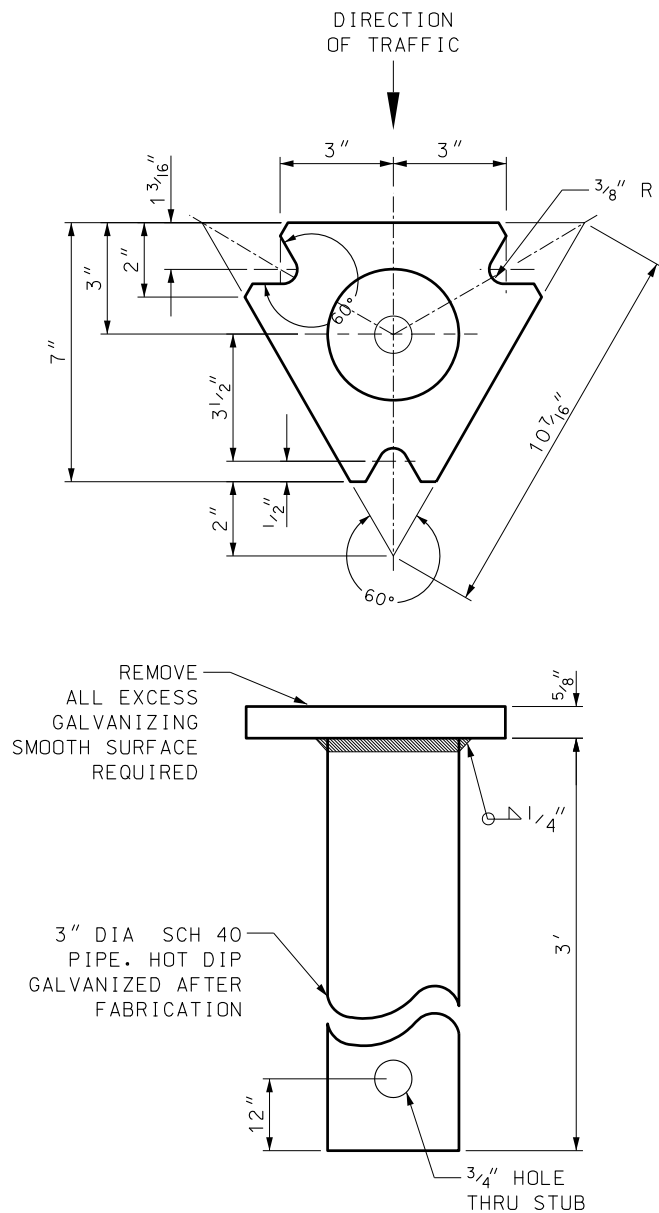
D:\04-10-2007\04-10-2007\Standards\Standards Committee\Meeting\10-2007\October25\07Mtg Drawings\SN10A.dgn

SLB-1 SLIPBASE TOP CASTING WITH LOCK RING

ASTM A 536
SEE NOTE 4

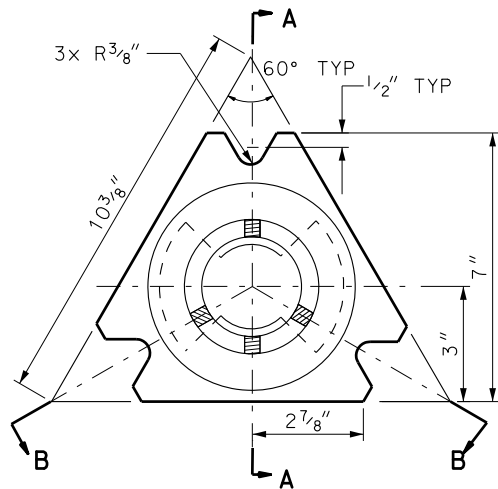


SLIPBASE GROUND STUB BASE USE WITH BOTH SLB-1 & SLB-2 TOP CASTINGS

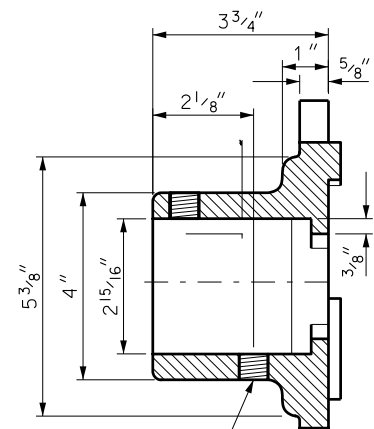


SLB-2 SLIPBASE TOP CASTING WITH SET SCREWS

ASTM A 536
SEE NOTE 5

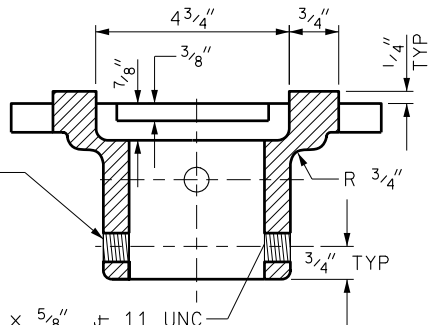


TOP VIEW



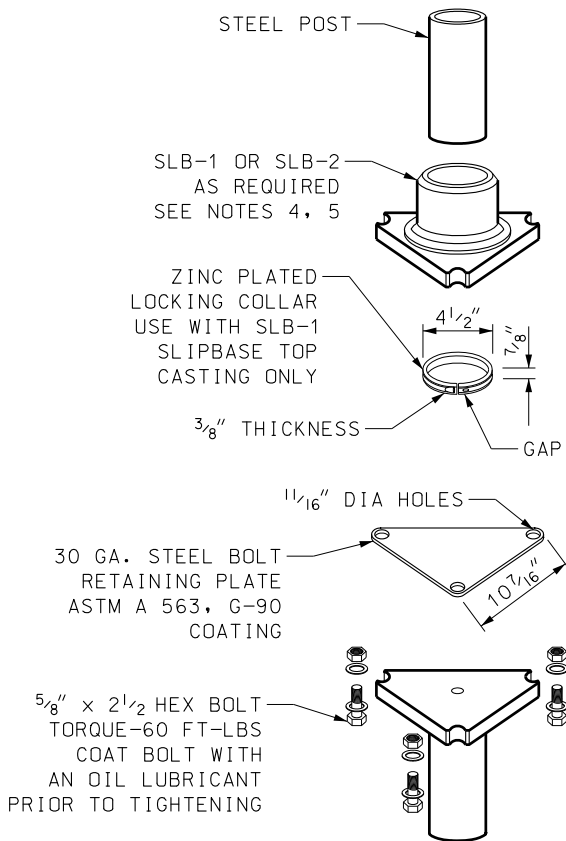
SECTION A-A

3 - 5/8" x 3/4" SOCKET
SET CUP SCREWS ZINC PLATED
TORQUE SET SCREWS TO
BETWEEN 40 & 60 FT LBS

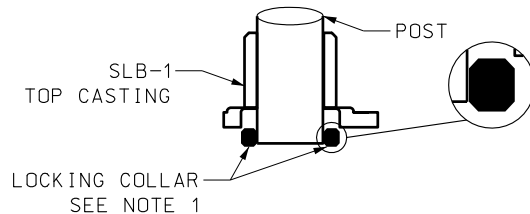


SECTION B-B

TYPICAL ASSEMBLY



LOCKING COLLAR INSTALLATION



NOTES:

1. INSTALL POST AT TOP OF LOWER CHAMFER OF LOCKING COLLAR.
2. SEAT AND TORQUE (60 FT LBS) LOCKING COLLAR ONTO POST PRIOR TO INSTALLING TOP CASTING ONTO POST STUB.
3. DRILL 1/2" HOLE IN ONE OF THE UPPER SET SCREW LOCATIONS AND INSTALL A SOCKET SET FULL DOG SCREW.
4. USE SLB-1, LOCK RING CASTING, WITH SIGN PANEL WIDTH OF 4 FEET OR LESS. DO NOT EXCEED 16 SQ FT.
5. USE SLB-2, SET SCREWS CASTING, WITH SIGN PANEL GREATER THAN 4 FEET WIDE.

POST DETAIL CHART

POST TYPE	OUTSIDE DIAMETER	WALL THICKNESS (GAUGE)	MATERIAL AND COATING REQUIREMENTS
P3	2 7/8"	0.134" (BWG 10)	ASTM-513 GALVANIZED TO MEET ASTM A-653-G90
P4	2 7/8"	0.160" (NP 40)	ASTM-513 GALVANIZED TO MEET ASTM A-653-G90
P5	2 7/8"	0.276" (SCH.80)	ASTM-500 GALVANIZED TO MEET ASTM-123

POST SIZE AND SIGN SIZE DETERMINED BY BASE
MANUFACTURER'S WIND LOADING REQUIREMENTS.

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

JAN.01.2008

DATE

JAN.01.2008

DATE

DATE

SLIPBASE
SIGN BASE (B3)
HARDWARE

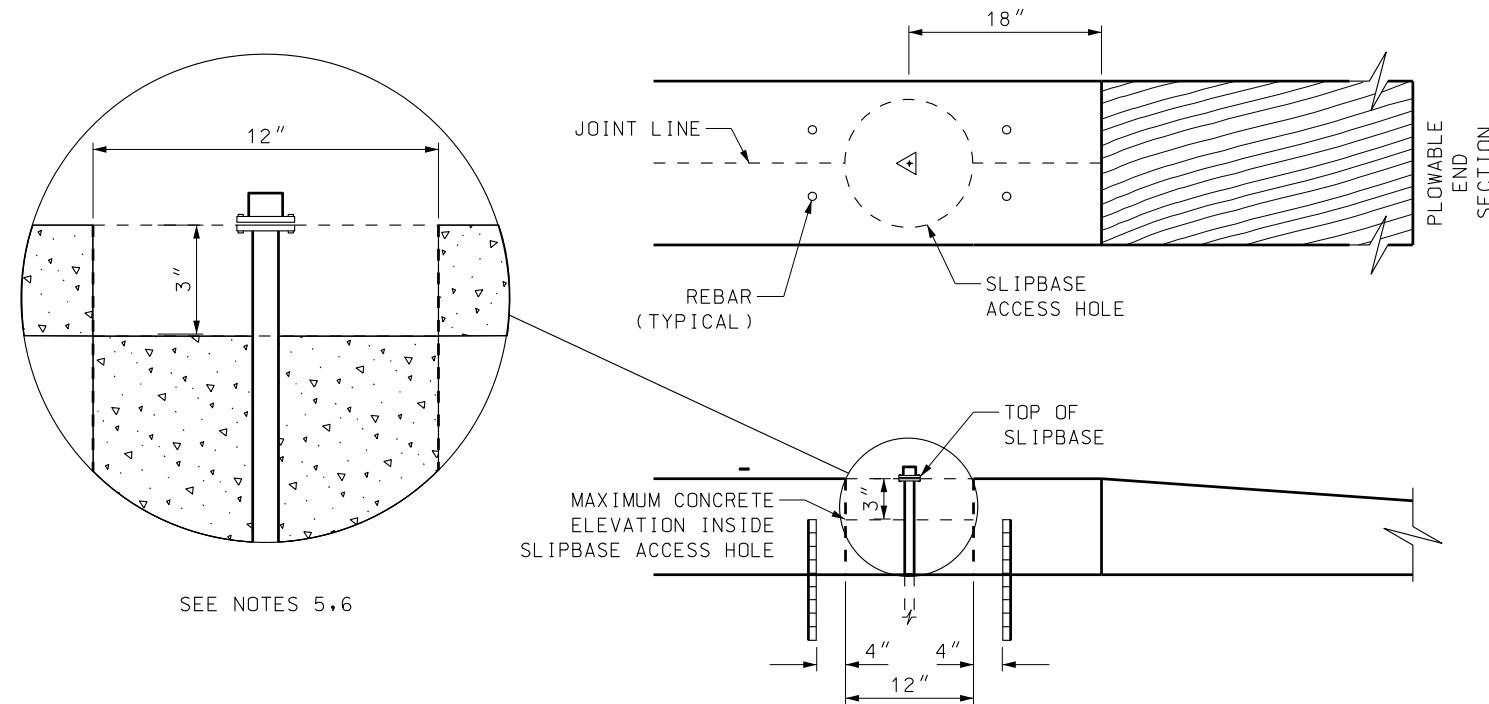
STANDARD DRAWING TITLE

STD DWG
SN 10A

Doc
Page
190

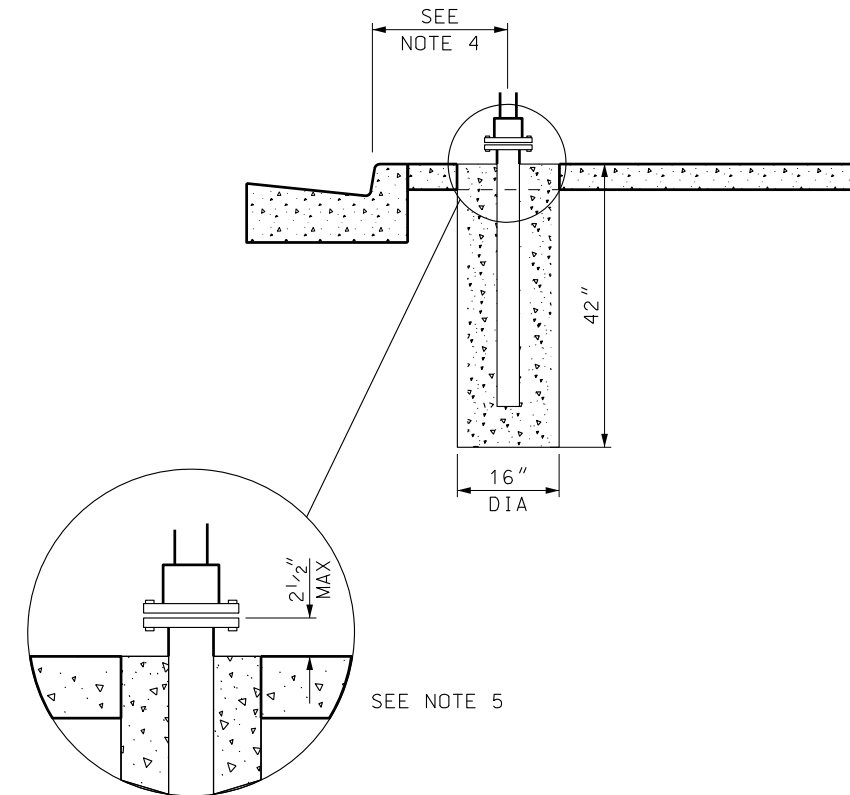
DRAFT

SLIPBASE DETAIL FOR RAISED ISLAND



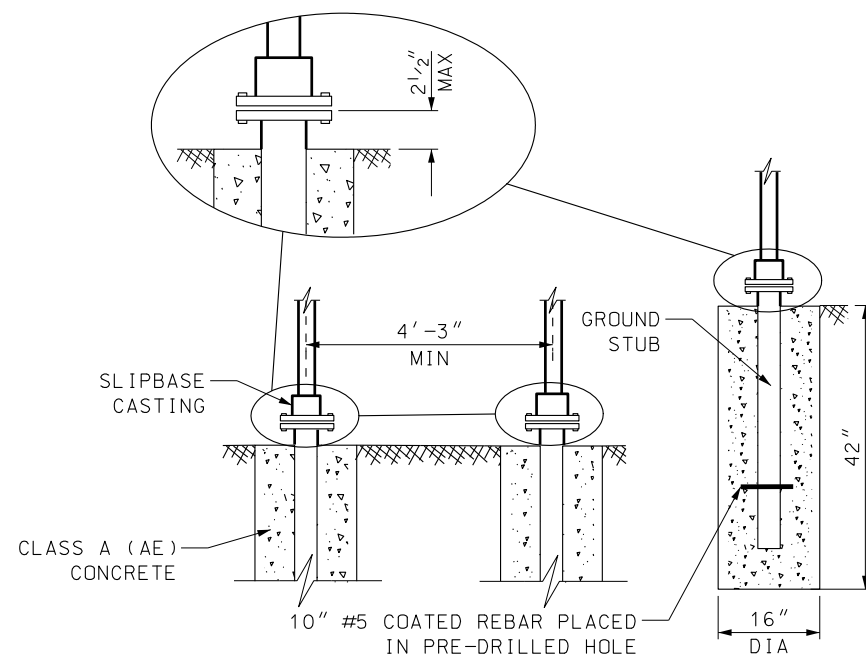
SIGN WILL NOT EXTEND INTO TRAVEL LANE

SLIPBASE DETAIL FOR SIDEWALK



SLIPBASE GROUND STUB FOUNDATION DETAIL

APPLIES TO SINGLE AND DOUBLE POST APPLICATIONS



POST SELECTION GUIDE SINGLE POST APPLICATION							
		SIGN WIDTH (FT)					
			2	2.5	3	4	5
SIGN HEIGHT (FT)	1				P3	P3	
	2				P3	P3	
	2.5				P3	P3	
	3				P4	P4	
	4		P3	P4	P4	P5	
	5		P3	P4	P4	P5	
	6		P3	P3	P4	P5	P5
	7		P3	P3	P4	P5	
"T" OR "U" BRACKET RECOMMENDED FOR SIGNS GREATER THAN 4 FEET WIDE							

POST SELECTION GUIDE							
DOUBLE POST APPLICATION							
		SIGN WIDTH (FT)					
		5	6	7	8	9	10
SIGN HEIGHT(FT)	4		P4	P4	P4	P5	P5
	5		P4	P5	P5	P5	P5
	6		P4	P5	P5	P5	P5
	7	P4	P5	P5	P5	P5	
	8	P5	P5	P5	P5		

NOTES:

1. REFER TO STD DWG SN 10A FOR POST REQUIREMENTS.
2. REFER TO STD DWG SN 13 SERIES FOR MOUNTING AND HARDWARE REQUIREMENTS.
3. WHEN INSTALLING A SUPPLEMENTAL SIGN DO NOT EXCEED MAXIMUM SQUARE FOOTAGE OF SINGLE POST APPLICATION BY MORE THAN 25%. (EX: POST P5 MAX. SIGN SIZE 5'W x 6'H = 30 SQ.FT. + 25% = $37\frac{1}{2}$ SQ.FT. = $(5'W \times 6'H) + (3'W \times 2.5'H) = 37\frac{1}{2}$).
4. REFER STD DWG SN 7A FOR HEIGHT AND OFFSET REQUIREMENTS.
5. CORE DRILL SLIPBASE HOLE. INSTALL AFTER PLACEMENT OF FINISHED GRADE OF CONCRETE OR ASPHALT.
6. ISLAND INSTALLATION: PLACE TOP OF SLIPBASE STUB FLUSH WITH TOP OF THE ISLAND, WITH A TOLERANCE OF $+1/8"$ (DO NOT PLACE BELOW TOP OF CURB).

REVISIONS

~~UTAH DEPARTMENT OF TRANSPORTATION~~
~~STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION~~

~~RECOMMENDED FOR APPROVAL~~

[Signature]
CHAIRMAN, STANDARDS COMMITTEE

APPROVED _____ DATE JAN.01.2008

DEPUTY DIRECTOR

NU.	DATE	APPR.	REMARKS
-----	------	-------	---------

SLIPBASE SIGN BASE (B3) INSTALLATION

STANDARD DRAWING TITLE

STD DWG
SN 10B

Doc
Page
191

Standards Committee Submittal Sheet

Name of preparer: Glenn Schulte

Title/Position of preparer: Transportation Safety Specialist

Specification/Drawing/Item Title: _____

Specification/Drawing Number: **NEW 2008**

SN 11 Tubular Steel Sign Bases (B4A , B4B)

**# SN 12 Barrier Mounted Tubular Steel Sign Bases
(B5A , B5B)**

Enter appropriate priority level:

(See last page for explanation) **3**

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

SN 11: The two sign bases detailed on this drawing are being used by Maintenance with little or no guidance.

Base B4A is a slip base system that can be installed on island or in other location where a concrete surface present. The design is based on the Slipbase described in SN 10 Series drawing. Because the mount is 4" tall upon final assembly a restriction on what is need to place on an island is define, this is the most likely application for this system. Details are given for the proper installation and the notes address the types of posts, hardware and offset requirements. This base meets NCHRP 350 crash test requirements.

Base B4B is also a surface mounted base, and can be mounted vertically or horizontally. Because this system does not meet NCHRP 350 crash test requirements is does require protection when used. Details are given for the proper installation and the notes address the types of posts, hardware requirements.

A base designation of B4A and B4B have been given.

SN 12: The two sign bases detailed on this drawing are being used by Maintenance, and in construction projects. They have not been detailed in the past but have extensive use on the roadway system. Both systems are mounted on top of a concrete barrier and both systems use the slipbase as detailed in SN 10.

Unclear guidance is out as to the requirement of a barrier mounted sign having to be crash worth, because of the limited amount of guidance it was decided to apply the slip base technology to these sign bases. The drawing details the fabrication requirements and installation requirements. The note address offset and sign size requirements. These base are being used on a statewide bases with no guidance of how attachment and sign installation is to occur.

*Base designation: B5A, for a constant slope barrier mounted sign base.
B5B, for a standard barrier section (Jersey shape).*

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

*New M & P item will have to be defined.
Standard Specification 02891 will be modified.*

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)
Spoke with Mr. Mont Wilson, had no comments

ACEC Comments: (Use as much space as necessary.)
NO COMMENTS AS OF 10/3/07, confirmed with Tyler Yorgenson receipt of package

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks

to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Construction Engineers

No objection were submitted, see review comments form for other submitted comments.

Contractors (Any additional contacts beyond “C” above.)

Chatfield Construction: confirmed package receipt 9/24/07

no comments received 10/3/07

Hikiau Associates: confirmed package receipt 9/24/07 with Mr. Gerald Peterson

no comments received 10/3/07

Interwest Safety: package picked up by Mr. Jim Fowers 9/20/07 no comments received 10/3/07

Intermountain Traffic Safety, Inc. confirmed package receipt 9/24/07 with Mr. Mike Knaras. no comments received 10/3/07

Suppliers

Interwest Safety: package picked up by Mr. Jim Fowers 9/20/07 no comments received 10/3/07

Intermountain Traffic Safety, Inc. confirmed package receipt 9/24/07 with Mr. Mike Knaras. no comments received 10/3/07

Safety Sign & Supply: confirmed package receipt 9/24/07 with Mr. Kelly Matkin no comments received 10/3/07

Consultants (as required) (Any additional contacts beyond “C” above.)

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Others (as appropriate)

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)
1. Minimum Sampling and Testing Guide (MS&T Guide)
 2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

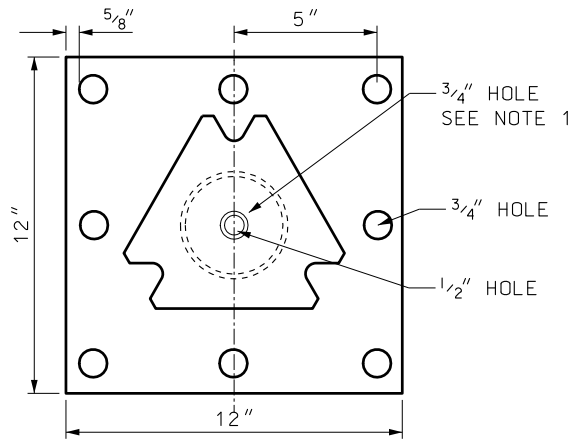
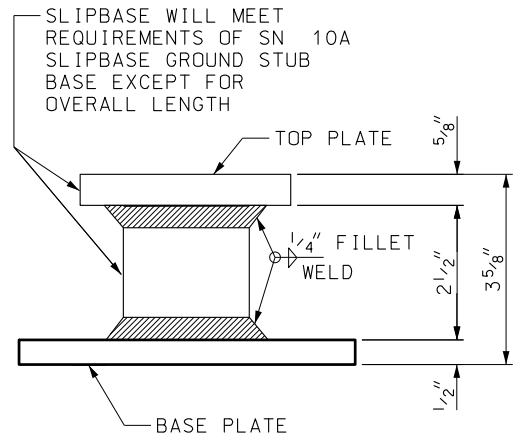
3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)
- F. Costs? (Estimates are acceptable.)
1. Additional costs to average bid item price.
Due to the current system of paying for signs cost for posts and bases is not available. Cost would be realized from the installation of a more appropriate sign post and base
 2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).
Should have little effect
 3. Life cycle cost.
- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)
- H. Safety Impacts?
- No information was found detailing any accident experience involving impact to these types of sign installations.*
- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.
- These bases are being used on statewide bases with no guidance of how base and sign installation is to occur. These drawing will give the guidance required.*

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

SLIPBASE TUBULAR STEEL SIGN BASE SURFACE MOUNT (B4A)
FOR 2 7/8" POSTS (P3, P4 OR P5 POSTS)



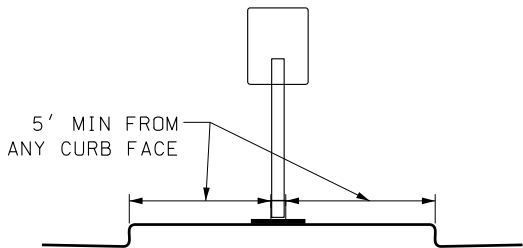
BASE PLATE DETAIL

BASE PLATE FABRICATION REQUIREMENTS:
BASE PLATE: 1/2" ASTM A 36 PLATE STEEL
PIPE STUB: 3" NOMINAL SCHEDULE 40,
ASTM A 53 GBR
TOP PLATE: MEET REQUIREMENTS OF SN 10A
GROUND STUB TOP PLATE REQUIREMENTS

MEET ASTM A-123 GALVANIZING AFTER
FABRICATION IS COMPLETED.

MOUNTING HARDWARE:
8- EACH 5/8" x 6" MECHANICAL WEDGE ANCHORS.
4- EACH 5/8" FLAT WASHERS
4- EACH 5/8" LOCK WASHERS
4- EACH 5/8" NUTS
ALL HARDWARE WILL BE GALVANIZED OR ZINC
PLATED.

INSTALLATION REQUIREMENTS:
DRILL: 8- 5/8" HOLES 6 1/2" DEEP, CLEAN
HOLE PRIOR TO INSTALL ANCHORS



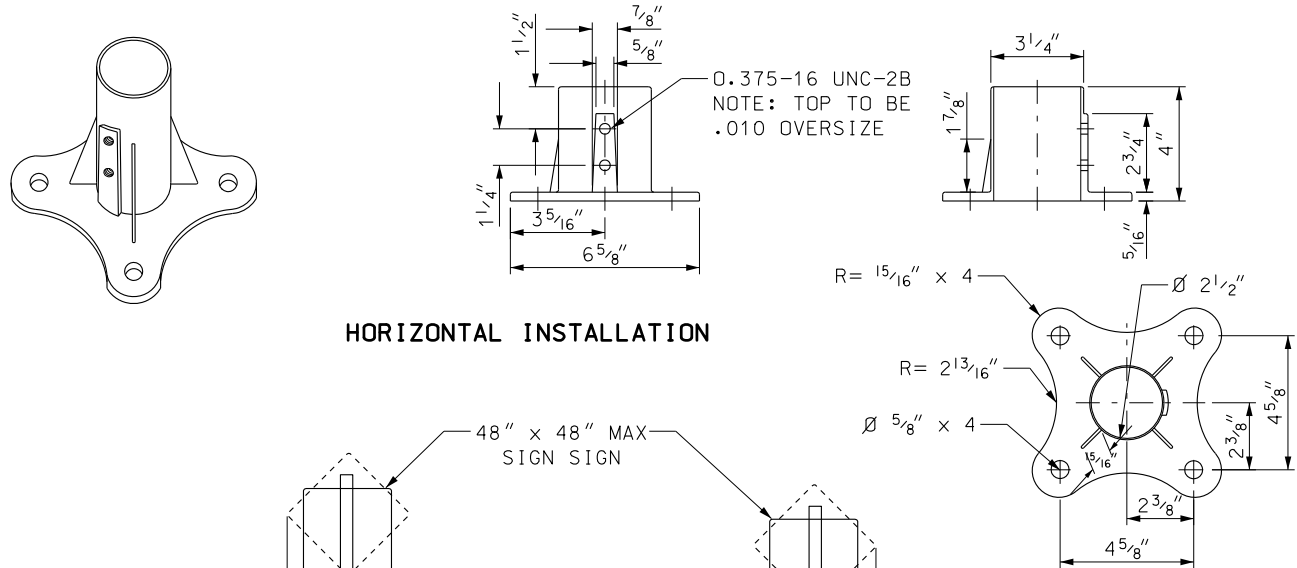
PLACEMENT DETAIL

SEE NOTE 4

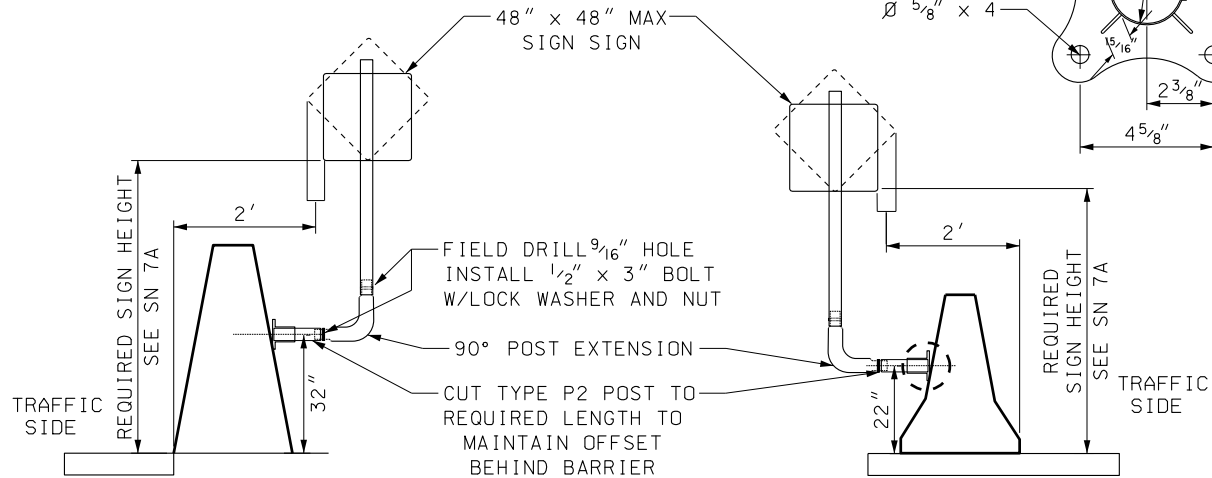
NOTES:

1. USE P3, P4 OR P5 POST. SEE STD DWG 10A.
2. REFER TO STD DWG SN 10A FOR ACCEPTABLE TOP CASTING AND ASSEMBLY REQUIREMENTS.
3. REFER TO STD DWG SN 13 SERIES FOR SIGN MOUNTING AND HARDWARE REQUIREMENTS.
4. REFER TO STD DWG SN 7 SERIES OFFSET NOT ADDRESSED IN PLACEMENT DETAIL AND FOR HEIGHT REQUIREMENT.

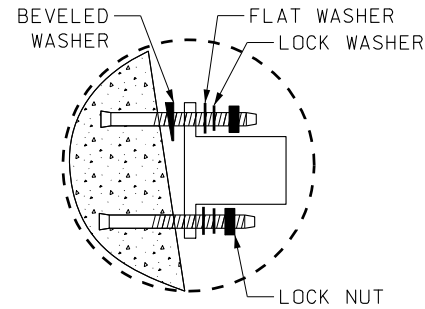
TUBULAR STEEL SIGN BASE SURFACE MOUNT (B4B)
FOR 2 3/8" POSTS (P1 OR P2 POSTS)



HORIZONTAL INSTALLATION



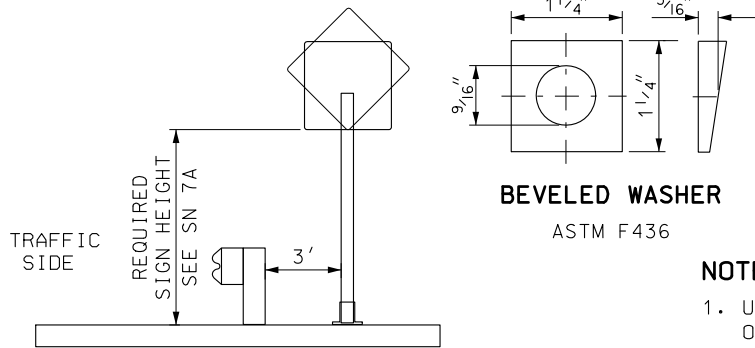
HORIZONTAL INSTALLATION NOTE:
USE A 90 DEGREE POST EXTENSION
WHEN MOUNTED HORIZONTALLY.
REFER TO STD DWG SN 13A FOR
POST EXTENSION REQUIREMENTS.



MOUNTING HARDWARE:
4- EACH 1/2" x 4" MECHANICAL WEDGE
ANCHORS.
4- EACH 1/2" FLAT WASHERS
4- EACH 1/2" LOCK WASHERS
4- EACH 1/2" NUTS
2- EACH BEVELED WASHERS. REQUIRED FOR
HORIZONTAL MOUNTING ONLY.
ALL HARDWARE WILL BE GALVANIZED OR
ZINC PLATED.

INSTALLATION REQUIREMENTS:
DRILL: 4- 1/2" HOLES 4 1/2" DEEP,
CLEAN HOLE PRIOR TO INSTALL ANCHORS

VERTICAL INSTALLATION



SEE NOTE 1

NOTES:

1. USE WHERE BASE IS FULLY PROTECTED OR OUTSIDE THE MAXIMUM REQUIRED CLEAR ZONE AS STATED IN THE LATEST EDITION OF THE ROADSIDE DESIGN GUIDE.
2. MOUNTING CAN BE VERTICAL OR HORIZONTAL.
3. USE P1 OR P2 POST. REFER TO STD DWG SN 9A.

REVISIONS				REMARKS
NO.	DATE	APPR.		

UTAH DEPARTMENT OF TRANSPORTATION		STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION	
RECOMMENDED FOR APPROVAL		DATE	
CHAIRMAN STANDARDS COMMITTEE		JAN.01.2008	
DEPUTY DIRECTOR		JAN.01.2008	

SURFACE MOUNTED TUBULAR STEEL SIGN BASES (B4A & B4B)		STANDARD DRAWING TITLE
STD DWG SN 11		

CONSTANT SLOPE BARRIER PLATE DETAIL



GENERAL NOTES:

-
- CONSTANT SLOPE MOUNTING HARDWARE:
- 4- EACH $\frac{3}{4}$ " X 4" MECHANICAL WEDGE ANCHORS
 - 4- EACH $\frac{3}{4}$ " FLAT WASHERS
 - 4- EACH $\frac{3}{4}$ " LOCK WASHERS
 - 4- EACH $\frac{3}{4}$ " NUTS
- ALL HARDWARE WILL BE GALVANIZED OR ZINC PLATED.
- INSTALLATION REQUIREMENTS:

STANDARD SECTION BARRIER PLATE DETAIL

[illegible]

~~UTAH DEPARTMENT OF TRANSPORTATION~~
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE COUNTY

RECOMMENDED FOR APPROVAL

[Signature]

JAN. 01, 2008

CHAIRMAN STANDARDS COMMITTEE
APPROVED

DATE JAN 01 2008

DEPUTY DIRECTOR _____ DATE _____

BARRIER MOUNTED TUBULAR STEEL SIGN BASES (B5A AND B5B)

STANDARD DRAWING TITLE

STD DWG
SN 12

Doc
Page
197

Standards Committee Submittal Sheet

Name of preparer: Glenn Schulte

Title/Position of preparer: Transportation Safety Specialist

Specification/Drawing/Item Title: _____

Specification/Drawing Number: **NEW 2008**

SN 13A Tubular Steel Sign Mounting Requirements

SN 13B Tubular Steel Sign Mounting Hardware

SN 13C "Z" Bar Mounting Requirements

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

SN 13 Series: This series was developed based on comments and concerns from maintenance, construction and contractors of not having enough guidance on how to attach a sign panel to the post and when what attachment hardware is required to make those attachments. Several manufactures were giving conflicting information based on their own designs and there are no UDOT standards to direct UDOT personnel or installation contractors. Included is additional hardware to add to posts when needed ("T" bracket, "U" brackets and extensions). Also a drawing was developed for the placement of "Z" bar. Again many of our sign manufacturers were confused when this would apply, there has been no formal standard of what "Z" bar application requirements are.

SN 13A: attachment details for the various applications. Also the additional post hardware.

SN 13B Clamping hardware and "Z" bar requirements

SN 13 C "Z" bar mounting requirements

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

*“T”, “U”, and Extension will be designated with a separate pay item
Standard Specification 02891 will be modified to include these items.*

*Mounting Hardware requirements will be included with the post designation
Standard Specification 02891 will be modified to direct the user to the appropriate
drawing for the appropriate attachment.*

*“Z” bar requirement will be paid for as part of the sign panel.
Standard Specification 02891 will be modified to indicate that.*

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at
<http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)
Spoke with Mr. Mont Wilson, had no comments

ACEC Comments: (Use as much space as necessary.)
NO COMMENTS AS OF 10/3/07, confirmed with Tyler Yorgenson receipt of package

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)
Construction Engineers
Limited comments, grammatical in nature

Designers

Limited comments, grammatical in nature, Region 4 Design squad submitted some technical changes that were addressed.

Contractors (Any additional contacts beyond “C” above.)

Chatfield Construction: confirmed package receipt 9/24/07

no comments received 10/3/07

Hikiau Associates: confirmed package receipt 9/24/07 with Mr. Gerald Peterson

no comments received 10/3/07

Interwest Safety: package picked up by Mr. Jim Fowers 9/20/07 no comments received 10/3/07

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Consultants (as required) (Any additional contacts beyond “C” above.)

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Others (as appropriate)

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)
1. Minimum Sampling and Testing Guide (MS&T Guide)
 2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)
 3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

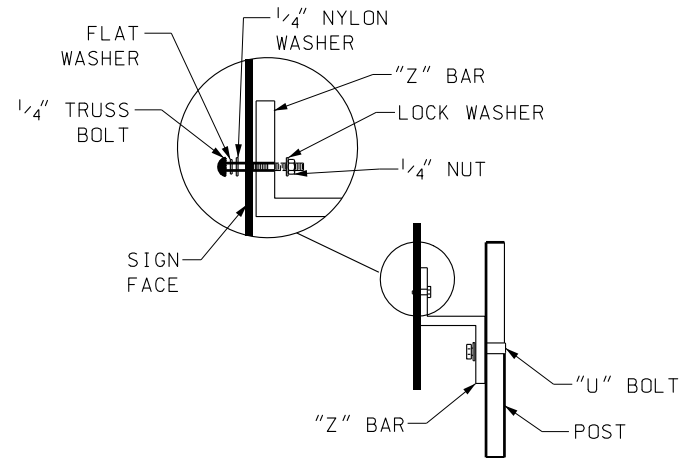
- F. Costs? (Estimates are acceptable.)
1. Additional costs to average bid item price.
Due to the current system of paying for signs changes in this item can not be determined but should be minimal.
 2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).
Maintenance should benefit from theses changes in the way repairs can be conducted with fewer parts.
 3. Life cycle cost.
- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)
The “Z” bar applications have shown less damage to the sign faces, anecdotal information, with a result of being able to reuse many sign that have been impacted.
- H. Safety Impacts?
- No effect, all system meet NCHRP 350 crash test criteria.*
- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

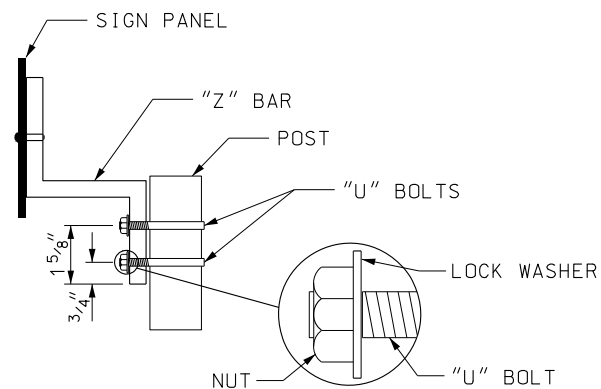
- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

ATTACHMENT TO POST WITH "Z" BAR AND "U" BOLT
FOR SIGN PANEL 36" WIDE



1. MEET THIS INSTALLATION REQUIREMENT WHEN SIGN IS ON A SINGLE POST ON MULTIPLE "Z" BARS.
2. A LONG U-BOLT IS REQUIRED. REFER TO STD DWG SN 13B FOR "U" BOLT REQUIREMENTS.

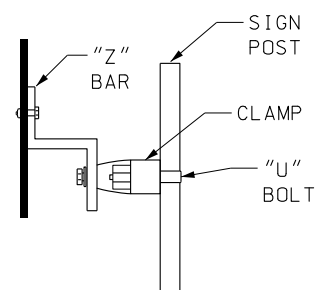
ATTACHMENT TO POST - SINGLE "Z" BAR AND
DOUBLE "U" BOLT
FOR SIGN PANELS WITH 24" HEIGHT OR LESS



1. MEET THIS REQUIREMENT WHEN SIGN PANEL HAS ONLY ONE "Z" BAR AND IS ATTACHED TO A SINGLE PANEL.
2. USE TWO LONG "U" BOLTS. REFER TO STD DWG SN 13B FOR "U" BOLT REQUIREMENTS.

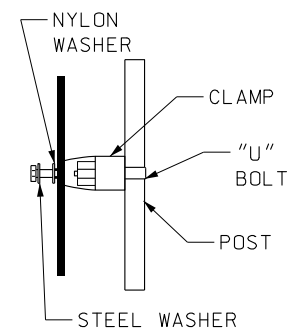
ATTACHMENT TO POST WITH "Z" BAR AND CLAMP
FOR DOUBLE POST APPLICATIONS

1. "Z" BAR AND SADDLE REQUIRED WHEN
SIGN IS MOUNTED ON DOUBLE POSTS.



ATTACHMENT TO POST WITH CLAMP
FOR SIGN PANEL 30" WIDE OR LESS

1. USE WITH P3, P4, AND P5 POSTS ON A SINGLE POST. DO NOT USE WITH MULTIPLE POSTS.
2. REFER TO STD DWG SN 13B FOR CLAMP AND HARDWARE REQUIREMENTS.

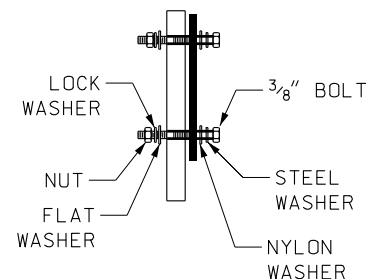


SIGN PANEL TO POST DIRECT CONNECTION
FOR SIGN PANEL 30" WIDE OR LESS WITH PREPUNCHED POST

BOLT & WASHER REQUIREMENTS

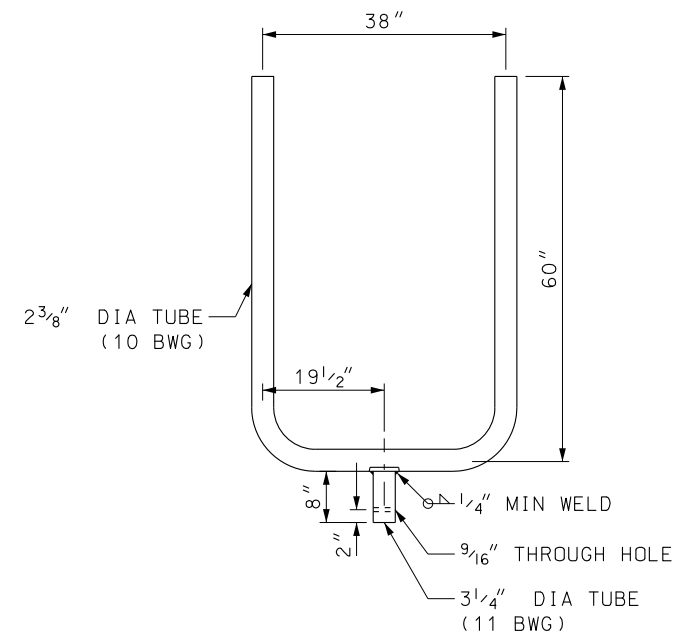
1. USE WITH P1 AND P2 POSTS.
2. HARDWARE:
 - 3/8" x 3" BOLT
 - 3/8" DIA. HEX HEAD BOLT WITH NUT
 - 3/8" DIA. STEEL FLAT WASHER
 - 3/8" DIA. STEEL LOCK WASHER
 - 3/8" DIA. NYLON WASHER
3. ALL STEEL COMPONENTS WILL BE GALVANIZED EXCEPT AS NOTED.

ASSEMBLY

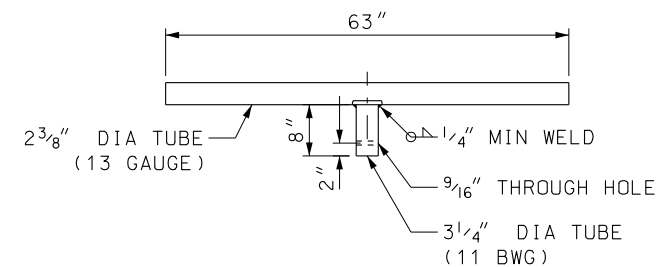


NOTES:

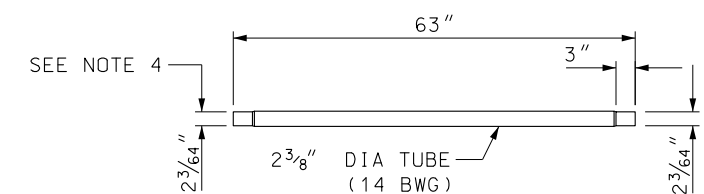
1. GALVANIZE PIPE TO MEET ASTM A 513.
2. COAT WELD JOINTS WITH ZINC RICH PAINT.
3. CUTTING OF "T" OR "U" BRACKET OR EXTENSION TO MEET REQUIRED LENGTH OR HEIGHT IS ACCEPTABLE. COAT CUT ENDS WITH ZINC RICH PAINT.
4. SWAGE ENDS OF EXTENSION TO PROVIDE A SNUG FIT IN A 2 $\frac{3}{8}$ " DIA (10 BWG) TUBING.
5. 2 $\frac{3}{8}$ " DIA 14 BWG TUBING PER ASTM A787 AWG FABRICATED FROM GALVANIZED STEEL SHEET .083" THICK, ASTM A653 SS GRADE G90. REMETALIZE WELD SEAM USING ZINC WIRE PER ASTM B833. TUBE OD WILL BE TREATED WITH CHROMATE CONVERSION SOLUTION AND PROTECTED WITH CLEAR ACRYLIC FILM.
6. BEND 90 DEGREES AND SWAGE 3" ON BOTH ENDS. SWAGE TO BE 1" FROM TANGENT POINT OF BEND RADIUS TO SHOULDER OF SWAGE. SWAGE TO FIT SNUG IN 14GA PIPE.
7. REFER TO SN 10 SERIES AND SN 11 FOR USE REQUIREMENTS OF BRACKETS AND EXTENSIONS.



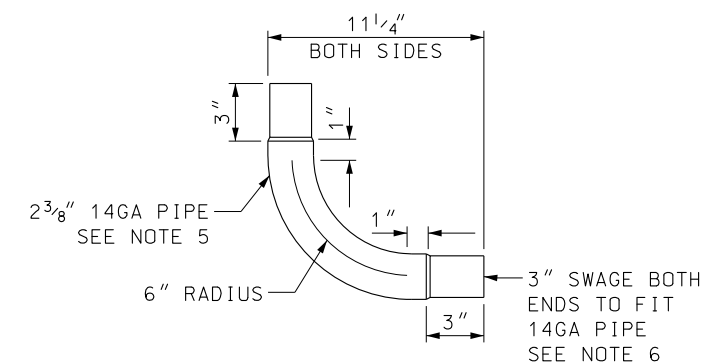
"U" BRACKET
SEE NOTE 7



"T" BRACKET
SEE NOTE 7



EXTENSION
SEE NOTE 7



90 DEGREE POST EXTENSION
SEE NOTE 7

REVISIONS					
NO.	DATE	APPR.	REMARKS		

~~UTAH DEPARTMENT OF TRANSPORTATION~~
~~STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION~~
~~SALT LAKE COUNTY~~

JAN.01,2008

JAN.01,2008
DATE

JAN.01,2008
DATE

DATE JAN.01,2008

~~CHAIRMAN STAND FOR COMMITTEE~~

~~Chairman Standing Committee~~

DEPUTY DIRECTOR

DEPUTY DIRECTOR

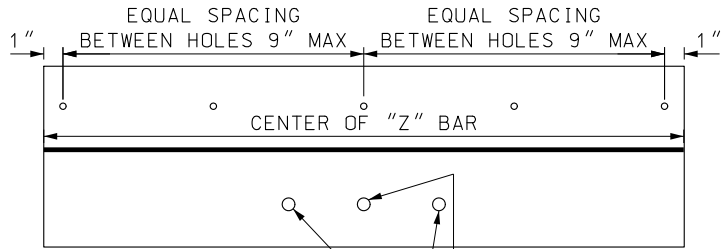
TUBULAR STEEL SIGN MOUNTING REQUIREMENTS

STANDARD DRAWING TITLE

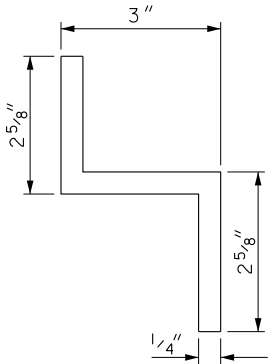
STD DWG
SN 13A

DGN File: D:\Standards\SpecSection\Standards Committee\Meeting\iles\2007\October\25\07Mtg\Drawings\SN13B.dgn 04-OCT-2007

"Z" BAR DETAIL



$\frac{13}{32}$ " SIGN MOUNTING CLAMP ATTACHMENT HOLE CENTERED ON "Z" BAR
 $\frac{13}{32}$ " "U" BOLT HOLES SPACING DETERMINED BY BOLT TYPE



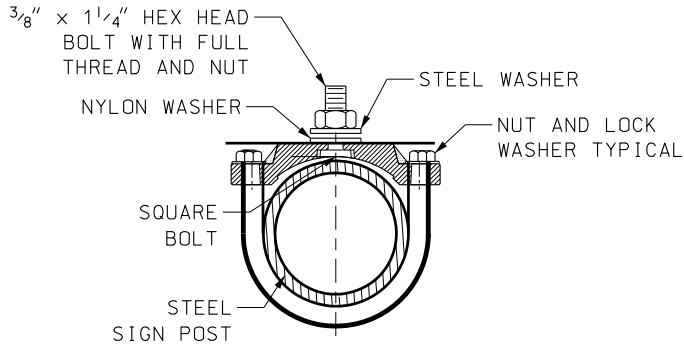
"Z" BAR
ASTM B 221-6061T6

DIMENSIONS FOR MOUNTING CLAMPS

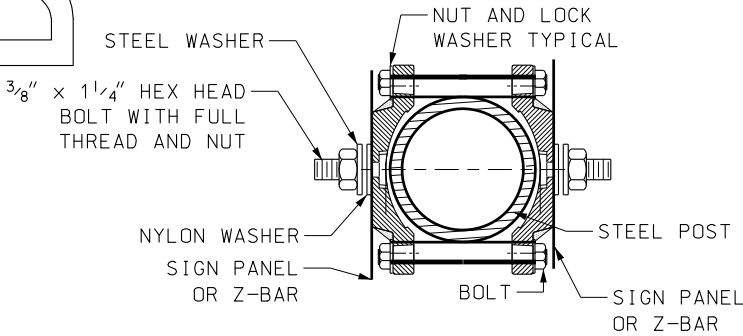
POST TYPE	A	B	C	D	E	F	G	K	L	R1	R2
P1-P2	3 3/4	2 3/4	1 1/2	1 1/8	1/2	3/16	1	2 11/16	1 7/32	1 1/4	1 3/16
P3-P4-P5	4 1/4	3 1/4	2	1 1/4	1/2	1/4	1	3 3/16	1 15/32	1 1/2	1 7/16

DRAFT

TYPICAL SINGLE BRACKET

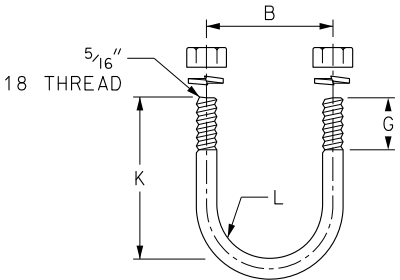


TYPICAL BACK TO BACK



P1 AND P2 BOLT LENGTH $\frac{3}{8}$ " \times 4"
P3, P4, & P5 BOLT LENGTH $\frac{3}{8}$ " \times 4 1/2"
WITH STEEL LOCK WASHER AND NUT

U-BOLT



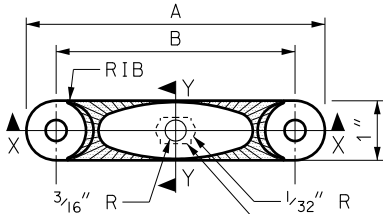
U-BOLT TO BE MADE IN ACCORDANCE WITH STANDARD MANUFACTURING PROCEDURE. $\frac{9}{32}$ " OR $\frac{5}{16}$ " DIAMETER STOCK IS PERMISSIBLE. AMERICAN STANDARD REGULAR SEMI-FINISHED HEX NUTS AND LOCKWASHERS.

USE A U-BOLT WITH A "K" LENGTH OF 4 1/2" WHEN SIGN PANEL HAS "Z" BAR. MOUNT SIGN PANEL DIRECTLY TO SIGN SUPPORT. NO MOUNTING CLAMP REQUIRED.

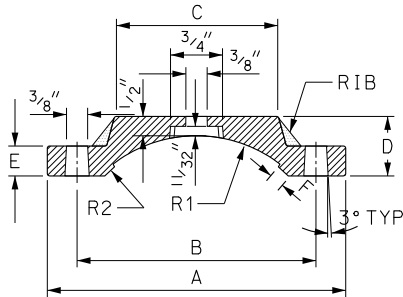
SIGN MOUNTING CLAMP FOR SOCKET OR SLIPBASE

PIPE CLAMP CASTING

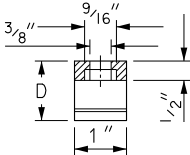
PIPE CLAMP CASTING: ASTM B-85 OR ALUMINUM ALLOY ANSI 360.0



SLOT TO HOLD HEAD OF $\frac{3}{8}$ " HEX HEAD BOLT



SECTION X-X



SECTION Y-Y

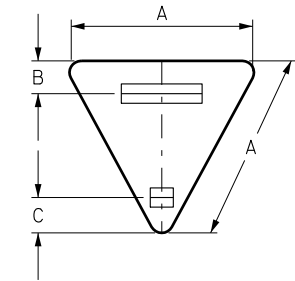
NOTES:

- USE GALVANIZING CONFORMING TO ASTM 135 FOR ALL COMPONENTS NOT MADE FROM ALUMINUM.
- REFER TO STD DWG SN 13A FOR SIGN MOUNTING REQUIREMENTS.

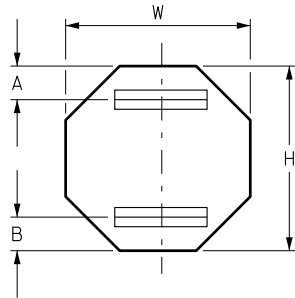
REVISIONS		NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION SAINT LAURENCE, UTAH	RECOMMENDED FOR APPROVAL	JAN.01.2008	DATE
	CHAIRMAN STANDARDS COMMITTEE	JAN.01.2008	DATE
	APPROVED		
	DEPUTY DIRECTOR		

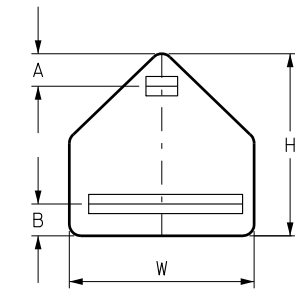
TUBULAR STEEL SIGN MOUNTING HARDWARE	STANDARD DRAWING TITLE
STD DWG SN 13B	Doc Page 203



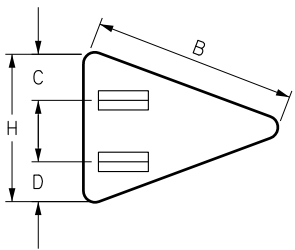
TRIANGLE SIGN			
A	B	C	"Z" BAR LENGTH
36"	8 1/2"	11 1/2"	1-18" 1-6"
48"	8 1/2"	14 1/2"	1-30" 1-6 1/4"



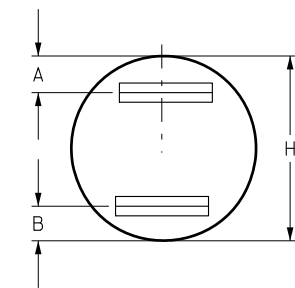
OCTAGON SIGN			
H/W	A	B	"Z" BAR LENGTH
36"	7 1/2"	4 1/2"	1-18" 1-12"
48"	7 1/2"	4 1/2"	1-24" 1-12"



PENTAGON SIGN			
H/W	A	B	"Z" BAR LENGTH
36"	9 1/2"	4 1/2"	1-11" 1-30"
48"	13 1/2"	4 1/2"	1-12" 1-42"



PENTAGON SIGN				
H	B	C	D	"Z" BAR LENGTH
36"	48"	12"	10"	1-18" 1-15"
48"	64"	15 1/2"	15 1/2"	2-27"

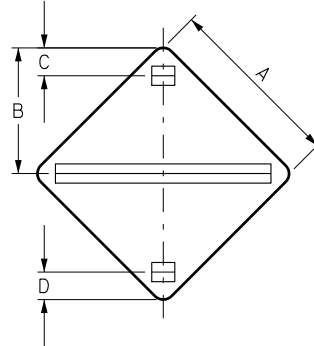


ROUND SIGN			
H	A	B	"Z" BAR LENGTH
36"	7 1/2"	8 1/2"	2-18"

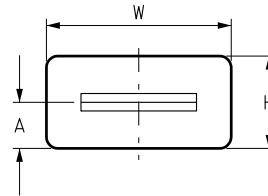
NOTES:

1. REFER TO STD DWG SN 13B FOR "Z" BAR REQUIREMENTS.
2. REFER TO STD DWG SN 13A FOR POST MOUNTING HARDWARE.

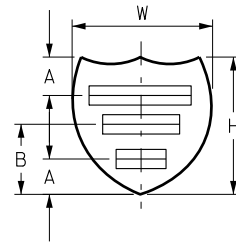
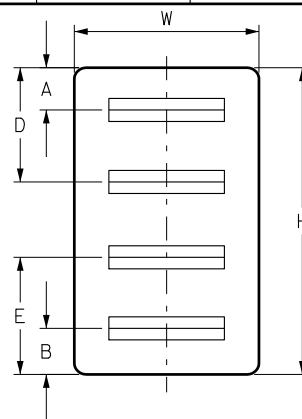
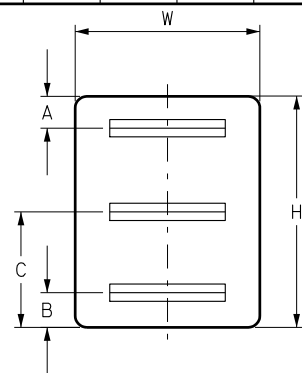
DIAMOND SIGN				
A	B	C	D	"Z" BAR LENGTH
36"	CENTERED	15"	11"	2-12" 1-42"
48"	CENTERED	15"	11"	2-12" 1-59"
60"	CENTERED	15"	11"	2-12" 1-77 1/2"



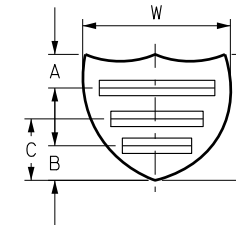
RECTANGULAR SIGN (SINGLE "Z")				
W	H	A	"Z" BAR LENGTH	POST AND BRACKET REQUIREMENT
36"	12" 18" 24"	CENTERED	30"	SINGLE POST
48"	12" 18" 24"	CENTERED	44"	SINGLE POST
≥60"	12" 18" 24"	CENTERED	SIGN WIDTH MINUS 6" CENTERED ON PANEL	1 POST WITH "T" OR "U" RECOMMENDED



RECTANGULAR SIGNS (MULTI "Z")								
W	H	A	B	C	D	E	"Z" BAR LENGTH	POST AND BRACKET RECOMMENDATION
36" TO 60"	36"	7 1/2"	4 1/2"	NOT REQUIRED			SIGN WIDTH MINUS 6" CENTERED ON PANEL	"W"=36" 1 POST "W">36" 1 POST WITH "T" OR "U" RECOMMENDED
36" TO 120"	48"	7 1/2"	4 1/2"	22 1/2"			SIGN WIDTH MINUS 6" CENTERED ON PANEL	"W"=36" 1 POST "W">36" & ≤60" 1 POST WITH "T" OR "U" RECOMMENDED "W">60" 2 POST REQUIRED
36" TO 120"	60"	7 1/2"	4 1/2"	28 1/2"			SIGN WIDTH MINUS 6" CENTERED ON PANEL	"W"=36" 1 POST "W">36" & ≤60" 1 POST WITH "T" OR "U" RECOMMENDED "W">60" 2 POST REQUIRED
36" TO 120"	72"	7 1/2"	4 1/2"		25 1/2"	22 1/2"	SIGN WIDTH MINUS 6" CENTERED ON PANEL	"W"=36" 1 POST "W">36" & ≤60" 1 POST WITH "T" OR "U" RECOMMENDED "W">60" 2 POST REQUIRED
36" TO 120"	84"	7 1/2"	4 1/2"		31 1/2"	28 1/2"	SIGN WIDTH MINUS 6" CENTERED ON PANEL	"W"=36" 1 POST "W">36" & ≤60" 1 POST WITH "T" OR "U" RECOMMENDED "W">60" 2 POST REQUIRED



INTERSTATE SHIELD (2 DIGITS)				
W	H	A	B	"Z" BAR LENGTH
36"	36"	8 1/2"	NOT REQUIRED	1-27" 1-13"
48"	48"	8 1/2"	22 1/2"	1-41" 1-36" 1-15"



INTERSTATE SHIELD (3 DIGITS)					
W	H	A	B	C	"Z" BAR LENGTH
45"	36"	8 1/2"	6 1/2"	16 1/2"	1-38" 1-18"
60"	48"	8 1/2"	6 1/2"	22 1/2"	1-54" 1-45" 1-18"

SMALL SIGNS & SUPPLEMENTAL SIGNS

"Z" BAR NOT REQUIRE ON SMALL OR SUPPLEMENTAL SIGNS EXCEPT AS NOTED: INSTALL "Z" BAR ON SMALL OR SUPPLEMENTAL SIGNS PLACED IN CONJUNCTION WITH SIGNS THAT HAVE "Z" BAR OR A FRAME.

W	H	"Z" BAR LENGTH	"Z" BAR PLACEMENT WHEN USED
12" 15" 18" 21"	12"	SIGN WIDTH MINUS 4" CENTERED ON PANEL	PLACE "Z" BAR AS PER RECTANGULAR SIGNS (SINGLE "Z")
24" 30" 36" 48" 60"	15"	SIGN WIDTH MINUS 6" CENTERED ON PANEL	
	18"		
12" 15" 18"	24"	SIGN WIDTH MINUS 4" CENTERED ON PANEL	PLACE "Z"BAR AS PER RECTANGULAR SIGNS (MULTI "Z") USING "H" '36' "A" AND "B" PLACEMENT REQUIREMENTS
24" 30" 36" 48" 60"	30"	SIGN WIDTH MINUS 6" CENTERED ON PANEL	
12" 15" 18"	48"	SIGN WIDTH MINUS 4" CENTERED ON PANEL	PLACE "Z" BAR AS PER RECTANGULAR SIGNS (MULTI "Z") USING APPROPRIATE "H" CONDITION FOR PLACEMENT OF "A", "B" AND "C"
24" 30"	60"	SIGN WIDTH MINUS 6" CENTERED ON PANEL	
12" 15" 18"	72"	SIGN WIDTH MINUS 4" CENTERED ON PANEL	PLACE "Z" BAR AS PER RECTANGULAR SIGNS (MULTI "Z") USING APPROPRIATE "H" CONDITION FOR PLACEMENT OF "A", "B", "D" AND "E"
24" 30"	84"	SIGN WIDTH MINUS 6" CENTERED ON PANEL	
"T" OR "U" BRACKET RECOMMENDED FOR SIGNS 48" WIDE AND PLACE ON A SINGLE POST.			

DRAFT

REVISIONS									
NO.	DATE	APPR.	REMARKS						

UTAH DEPARTMENT OF TRANSPORTATION		STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION		JAN.01.2008	
RECOMMENDED FOR APPROVAL		SAINT LAURENCE		DATE	
CHAIRMAN STANDARDS COMMITTEE		APPROVED		JAN.01.2008	
DEPUTY DIRECTOR		DATE		DATE	

"Z" BAR MOUNTING REQUIREMENTS

Standards Committee Submittal Sheet

Name of preparer: Glenn Schulte

Title/Position of preparer: Transportation Safety Specialist

Specification/Drawing/Item Title: SN 12 Series being Replaced with the following

Specification/Drawing Number: NEW 2008

SN 14A Freeway Sign Post Requirements

SN 14B Freeway Sign Post Requirements

SN 14C Freeway Sign Foundation & Fuse Plate Req.

SN 14D Freeway Sign Frame Installation Details

SN 14E Freeway Sign Bracket Details

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

The current SN 12 Series drawings have so much information that it is very hard to determine the right application and installation of this signing system. Additionally some base standard have change and post-spacing requirements are no longer acceptable. One sign base, inclined base with S & W posts, had very limited application and use, was deleted from SN 14 series.

SN 14A (parts of 12A Removed various parts of the drawing and put them on other drawing where applicable.) Redefined Sign –Post- Foundation table from SN 12A. Made chart more useful, eliminated sign dimensions that were not applicable to this sign system. Developed post spacing chart base on current standard from the RDG. Added notes that apply to the series of drawings.

SN 14B(parts of 12A & 12B) Drawing is for the post base connection requirements and post types.

SN 14C (parts of 12A & 12B) defines foundation requirements and has new Fuse Plate and Splice Plate details. The fuse plate has been test and used in various other states. This fuse plate is less sensitive to wind conditions and does not have a torque requirement.

SN 14D (12C) The framing requirements for large signs. Added Exit Number Top Placard to detail, this will bring UDOT into compliance with the current MUTCD.

SN 14E (SN 12C) Bracket details and attachment requirements. Developed notes and added the acceptance of "Z" bar for these types of signs.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

Posts, bases, sign attachment hardware and foundations will be added as a pay item. Frame will be added to the sign pane land be included as part of the pay item for the sign.

Standard Specification 02891 will be modified to include these items.

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)
Spoke with Mr. Mont Wilson, had no comments

ACEC Comments: (Use as much space as necessary.)
NO COMMENTS AS OF 10/3/07, confirmed with Tyler Yorgenson receipt of package

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design,

maintenance) (Include all applicable in-house areas even if not listed above.)

Construction Engineers

Limited comments

Designers

Limited comments, grammatical in nature, Region 4 Design squad submitted some technical changes that were addressed.

Contractors (Any additional contacts beyond “C” above.)

Chatfield Construction: confirmed package receipt 9/24/07

no comments received 10/3/07

Hikiau Associates: confirmed package receipt 9/24/07 with Mr. Gerald Peterson

no comments received 10/3/07

Interwest Safety: package picked up by Mr. Jim Fowers 9/20/07 no comments received 10/3/07

Intermountain Traffic Safety, Inc. confirmed package receipt 9/24/07 with Mr. Mike Knaras. no comments received 10/3/07

Suppliers

Interwest Safety: package picked up by Mr. Jim Fowers 9/20/07 no comments received 10/3/07

Intermountain Traffic Safety, Inc. confirmed package receipt 9/24/07 with Mr. Mike Knaras. no comments received 10/3/07

Safety Sign & Supply: confirmed package receipt 9/24/07 with Mr. Kelly Matkin no comments received 10/3/07

Consultants (as required) (Any additional contacts beyond “C” above.)

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Others (as appropriate)

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)
1. Minimum Sampling and Testing Guide (MS&T Guide)
 2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)
 3. Implementation Plan (Provide detailed instructions on how the subject item will

be implemented to include notification of all interested parties and training requirements.)

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.
Due to the current system of paying for signs changes in this item cannot be determined but should be minimal.
2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).
Maintenance should benefit from theses changes in the way repairs can be conducted.
3. Life cycle cost.

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.)
(Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

H. Safety Impacts?

No effect.

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

CHART EXPLANATION
TOP NUMBER: SIZE AND WEIGHT OF SUPPORT SECTION OR DIAMETER OF STANDARD PIPE COLUMNS. Ø DENOTES PIPE DIAMETER BOTTOM NUMBER: MINIMUM REQUIRED DEPTH OF FOUNDATION

1. CONFORM TO THE LATEST EDITION OF AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES AND TRAFFIC SIGNALS.
2. FABRICATE BASE, SLIP AND FUSE PLATE FROM STEEL MEETING THE REQUIREMENTS SPECIFIED FOR THE SIGN POST TO WHICH THEY ARE ATTACHED EXCEPT WHERE PIPE POSTS ARE USED, IN WHICH CASE CONFORM TO THE REQUIREMENTS OF ASTM A 36.
3. USE STRUCTURAL CARBON STEEL CONFORMING TO THE FOLLOWING ASTM DESIGNATION: STANDARD PIPE 3" TO 8" DIA PIPE: ASTM A 53 GRADE B, W AND S SHAPES: ASTM A 36.
4. USE BOLTS, NUTS AND WASHER CONFORMING TO ASTM A 325 UNLESS OTHERWISE NOTED.
5. WELD TO THE REQUIREMENTS OF THE AASHTO STANDARD SPECIFICATION FOR WELDING OF STRUCTURAL STEEL OF HIGHWAY BRIDGES.
6. SAW CUT OR SHEAR OF PLATES. NO FLAME CUTTING.
7. MEET ASSHTO M 111 (ASTM 123) FOR GALVANIZING AFTER FABRICATION IS COMPLETED.
8. REFER TO STD DWGS SN 7A AND 7B FOR SIGN HEIGHT AND SIGN OFFSET REQUIREMENTS.

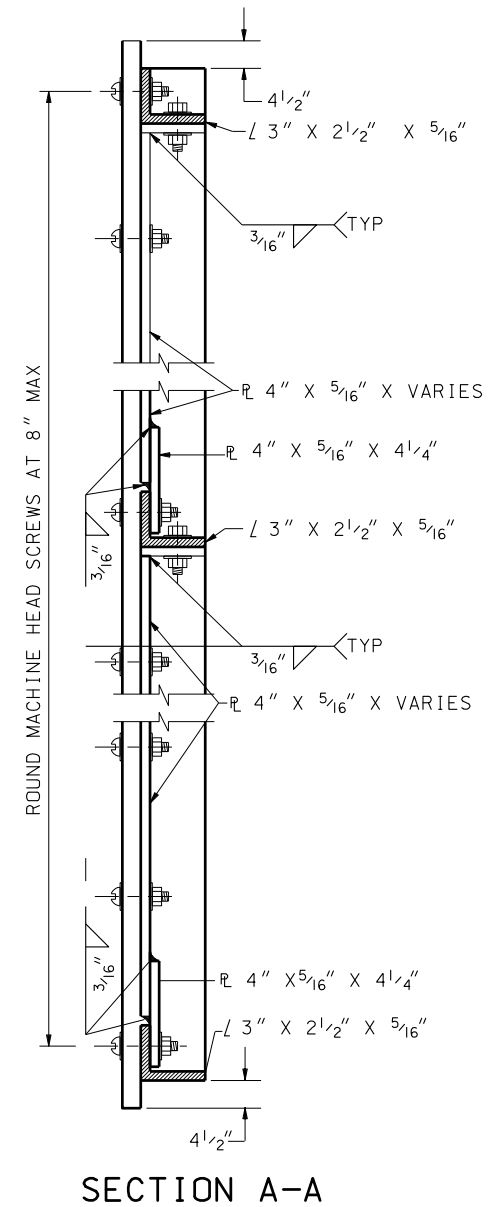
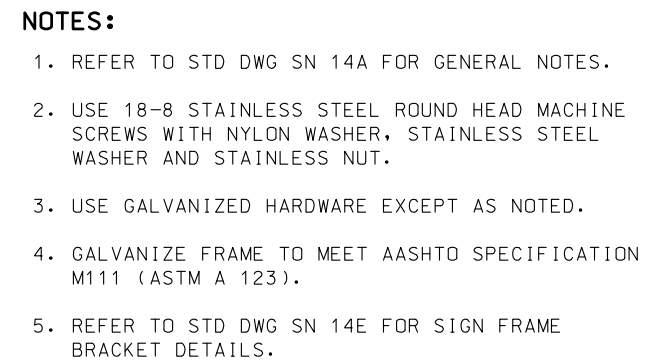
TWO POST	
SIGN WIDTH	POST SPACING
	A
6'	1'
7'	1'
8'	1'
9'	1'
10'	1'
11'	1½'
12'	2'
13'	2½'
14'	3'
15'	3½'
16'	3½'

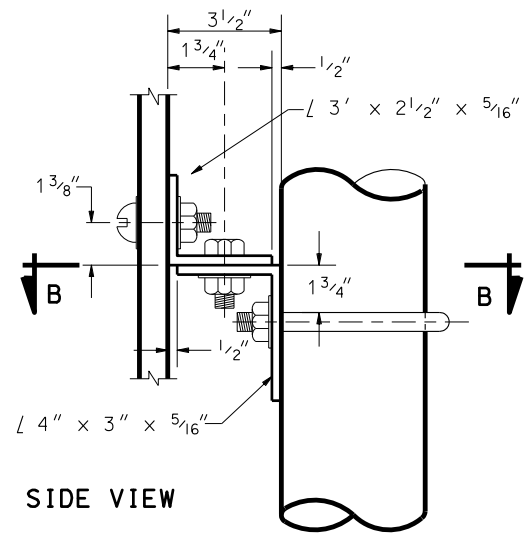
The diagram illustrates a three-legged splice plate used for connecting piles. The main rectangular frame has a width labeled (W) and a height labeled (H) . The top horizontal member is divided into two unequal segments. Three vertical legs extend downwards from the corners of the frame. The distance between the centerlines of the outer legs is labeled B , and the distance between the centerlines of the two inner legs is also labeled B . The vertical distance from the top of the frame to the centerline of the middle leg is labeled A . The label "SPLICE PLATE" points to the top horizontal member. The three vertical legs are shown passing through a horizontal line representing the ground surface, with the lower portion of each leg embedded in a pile, which is depicted as a shaded cylinder with a stippled pattern.

REMENTS

DRAFT

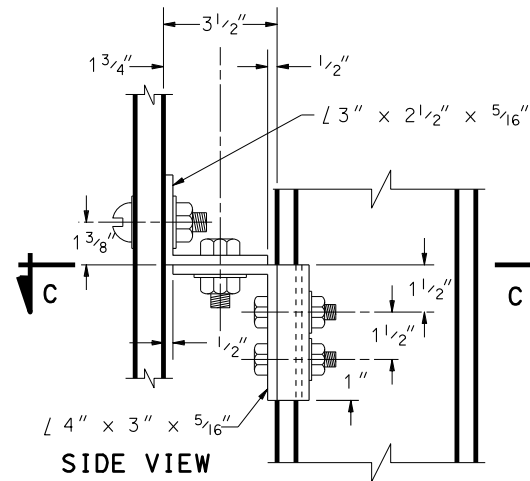
STD DWG SN 14A	FREEWAY SIGN POST REQUIREMENTS
STANDARD DRAWING TITLE	

[illegible]



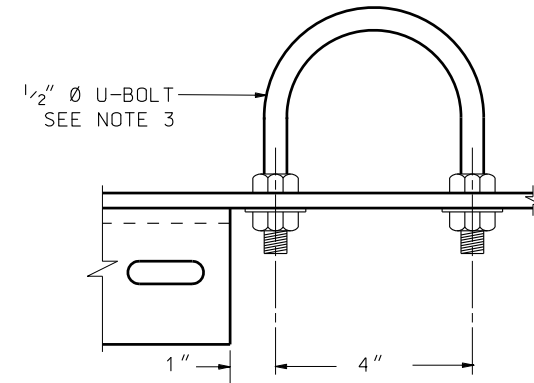
BRACKET DETAIL

(FOR PIPE POST)
SEE NOTE 2

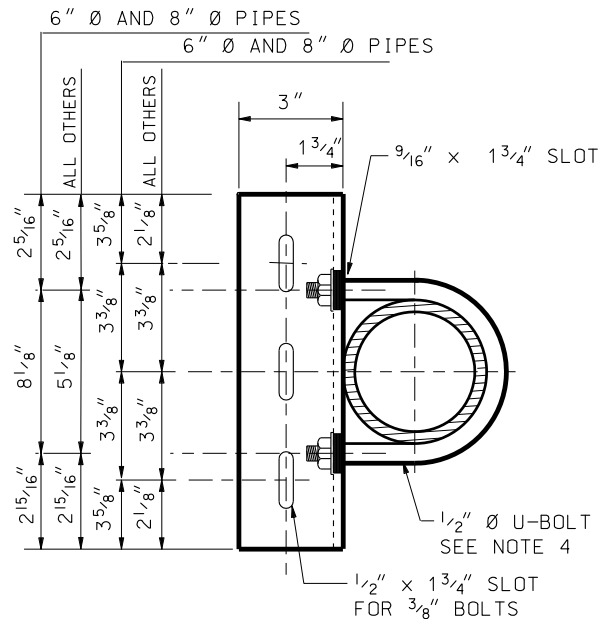


BRACKET DETAIL

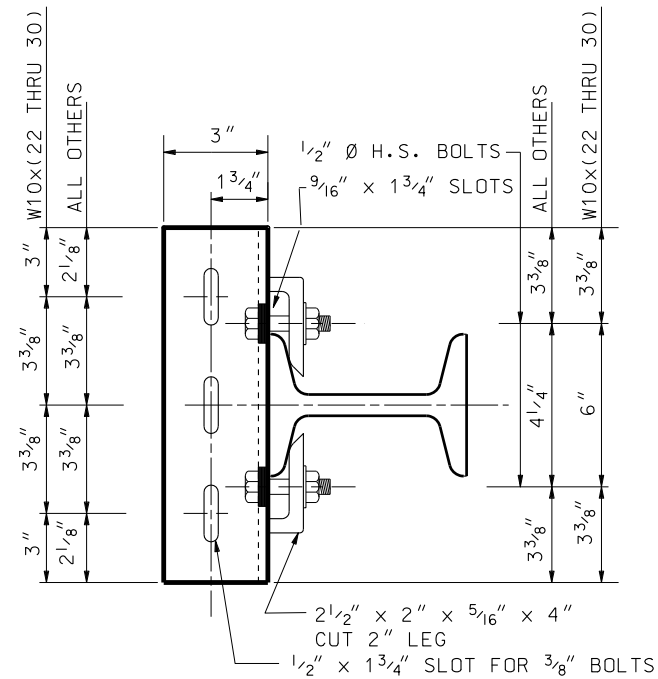
(FOR S OR W POST)
SEE NOTE 2



HANDLING BRACKET DETAIL



SECTION B-B



SECTION C-C

DRAFT

NOTES:

1. REFER TO STD DWG SN 14A FOR GENERAL NOTES.
2. "Z" BAR TO POST ATTACHMENT ACCEPTABLE AS PER STD DWG SN 14A SIGN PANEL POST FOUNDATION TABLE.
3. USE GALVANIZED HARDWARE EXCEPT AS NOTED.

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

RECOMMENDED FOR APPROVAL
JAN.01.2008
DATE
JAN.01.2008
DATE
APPROVED
JAN.01.2008
DATE
DEPUTY DIRECTOR

FREeway SIGN
BRACKET
DETAILS

STD DWG
SN 14E

STANDARD DRAWING TITLE

Standards Committee Submittal Sheet

Name of preparer: Glenn Schulte

Title/Position of preparer: Safety Specialist

Specification/Drawing/Item Title: 02891 Traffic Signs and M & P Document

Specification/Drawing Number: _____

Enter appropriate priority level:

(See last page for explanation) 3 Should go into effect with 2008 Stds. & Specifications

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Based on changes in Std. Dwgs. and request from designer, suppliers and some construction crews for clearer requirements and designation of sign types, bases and posts.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

New item added to M & P

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

Std. Spec. 02891 and M & P proposal sent to Mr. Mont Wilson, 9/21/2007, subsequent phone conversation 9/25/07, Mr. Wilson indicated he had some concerns with the additional pay items but didn't think it should be of great concern.

ACEC Comments: (Use as much space as necessary.)

Std. Spec. 02891 and M & P proposal sent to Mr. Tyler Yorgason, 9/21/2007, made phone contact 10/1/07, Mr. Yorgason indicated he had received package. Minor comments received, grammatical and punctuation.

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Received some comments detail grammatical errors and some technical issues. Region 4 Design Squad sent in extensive revisions, which were addressed. See attachment

Construction Engineers

Some small technical issues addressed and some grammatical issues.

Mr. Fred Jenkins, R.E Price District did have some concerns with additional pay items.

Contractors (Any additional contacts beyond "C" above.)

Hikiau Associates, Chatfield Construction, Interwest Safety, Intermountain Traffic Safety, Safety Sign & Supply

Contacted all, confirmed receipt of package

Phone conversations with Interwest Safety Supply, and Intermountain Safety. No other responses received 10/3/07

Suppliers

Universal Sales, Interwest Safety, Intermountain Traffic, Safety Sign & Supply

Contacted all, confirmed receipt of package, no response as of 10/3/07

Consultants (as required) (Any additional contacts beyond "C" above.)

None

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Received comments from Mr. Roland Stanger, had a few comments with call out in the M & P, were addressed.

Others (as appropriate)

See call Comment form for those sent documents

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

NONE

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

M & P document will have to be updated

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Implement as part of the 2008 Standard Specifications and Standard Drawings

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

Based on the way UDOT currently does sign payments on projects it is very difficult to estimate a cost.

I believe as the committee believes that cost will be reduced because of the inclusion of separate pay items. The additional pay items will give the suppliers and contractor exact requirements for the post, base and foundation requirements.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

No change has been indicated.

3. Life cycle cost.
Some benefit could be realized with using a less expensive post and base in area with limited impacts.

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Based on the way UDOT currently does sign payments on projects it is very difficult to estimate a cost.

I believe as the committee believes that cost will be reduced because of the inclusion of separate pay items. The additional pay items will give the suppliers and contractor exact requirements for the panel, post, base and foundation requirements.

Conversation with two suppliers, Interwest safety Supply, and Intermountain Safety indicate it will be easier to bid a package because they will know exactly what to bid.

- H. Safety Impacts?

None, all systems have been crash tested and meet NCHRP 350 crash criteria.

- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Over the course of this endeavor and in the past I have had several conversation with all concerned detail how to bid items, how to pay for items, ie foundation, which post is required for which base, with the proposed changes and additional call out UDOT should get a better product.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

PROPOSAL FOR JANUARY 1, 2008

Added verbiage under each sign call out # 028910022 to 028910238

Section 02891: Traffic Signs

#	028910020	Auxiliary Sign, Type A-1	Square Feet
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Can be deleted if new Std. Specification 02891 is adopted

#	028910022	Sign Type A-1	Each Square Feet
Includes frame or "Z" bar as required as per Standard Drawing SN Series			

#	028910025	Sign Type A-1, 12 inch X 18 inch	Each
Includes frame or "Z" bar as required as per Standard Drawing SN Series			

#	028910026	Sign Type A-1, 12 inch X 24 inch	Each
Includes frame or "Z" bar as required as per Standard Drawing SN Series			

#	028910028	Sign Type A-1, 12 inch X 36 inch	Each
Includes frame or "Z" bar as required as per Standard Drawing SN Series			

#	028910030	Sign Type A-1, 21 inch X 15 inch	Each
Includes frame or "Z" bar as required as per Standard Drawing SN Series			

#	028910035	Sign Type A-1, 24 inch	Each
Includes frame or "Z" bar as required as per Standard Drawing SN Series			

#	028910037	Sign Type A-1, 24 inch X 24 inch	Each
Includes frame or "Z" bar as required as per Standard Drawing SN Series			

#	028910040	Sign Type A-1, 24 inch X 12 inch	Each
Includes frame or "Z" bar as required as per Standard Drawing SN Series			

#	028910045	Sign Type A-1, 24 inch X 18 inch	Each
Includes frame or "Z" bar as required as per Standard Drawing SN Series			

#	028910050	Sign Type A-1, 24 inch X 30 inch	Each
Includes frame or "Z" bar as required as per Standard Drawing SN Series			

#	028910055	Sign Type A-1, 30 inch X 24 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910060	Sign Type A-1, 30 inch X 30 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910065	Sign Type A-1, 36 inch X 36 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910070	Sign Type A-1, 48 inch X 48 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910075	Auxiliary Sign Type A-2	Square Feet
Can be deleted if new Std. Specification 02891 is adopted			
#	028910077	Sign Type A-2	Each Square Feet
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910080	Sign Type A-2, 12 inch X 18 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910085	Sign Type A-2, 21 inch X 15 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910090	Sign Type A-2, 24 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910093	Sign Type A-2, 24 inch x 8 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910095	Sign Type A-2, 24 inch x 12 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			

#	028910097	Sign Type A-2, 24 inch x 24 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910100	Sign Type A-2, 24 inch x 18 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910105	Sign Type A-2, 24 inch x 30 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910107	Sign Type A-2, 30 inch x 8 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910109	Sign Type A-2, 30 inch x 18 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910110	Sign Type A-2, 30 inch x 24 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910115	Sign Type A-2, 30 inch x 30 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910120	Sign Type A-2, 36 inch x 36 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910125	Sign Type A-2, 48 inch x 48 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910127	Sign Type A-2, 60 inch x 18 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910129	Sign Type A-2, 60 inch x 18 inch	Each

Duplicate to 28910127

#	028910130	Auxiliary Sign Type P-1	Square Feet
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Can be deleted if new Std. Specification 02891 is adopted

“P” designation may change to “PW” or “W” based on decision from Standard Committee.

#	028910132	Sign Type P-1	Each Square Feet
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Includes frame or “Z” bar as required as per Standard Drawing SN Series

#	028910135	Sign Type P-1, 12 inch x 18 inch	Each
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Includes frame or “Z” bar as required as per Standard Drawing SN Series

#	028910137	Sign Type P-1, 12 inch x 36 inch	Each
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Includes frame or “Z” bar as required as per Standard Drawing SN Series

#	028910140	Sign Type P-1, 21 inch x 15 inch	Each
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Includes frame or “Z” bar as required as per Standard Drawing SN Series

#	028910145	Sign Type P-1, 24 inch	Each
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Includes frame or “Z” bar as required as per Standard Drawing SN Series

#	028910147	Sign Type P-1, 24 inch x 24 inch	Each
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Includes frame or “Z” bar as required as per Standard Drawing SN Series

#	028910150	Sign Type P-1, 24 inch x 12 inch	Each
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Includes frame or “Z” bar as required as per Standard Drawing SN Series

#	028910155	Sign Type P-1, 24 inch x 18 inch	Each
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Includes frame or “Z” bar as required as per Standard Drawing SN Series

#	028910160	Sign Type P-1, 24 inch x 30 inch	Each
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Includes frame or “Z” bar as required as per Standard Drawing SN Series

#	028910165	Sign Type P-1, 30 inch x 24 inch	Each
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Includes frame or “Z” bar as required as per Standard Drawing SN Series

#	028910170	Sign Type P-1, 30 inch x 30 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910175	Sign Type P-1, 36 inch x 36 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910180	Sign Type P-1, 48 inch x 48 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910185	Auxiliary Sign Type P-2	Square Feet
Can be deleted if new Std. Specification 02891 is adopted			
#	028910187	Sign Type P-2	Each Square Feet
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910190	Sign Type P-2, 12 inch x 18 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910195	Sign Type P-2, 21 inch x 15 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910200	Sign Type P-2, 24 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910205	Sign Type P-2, 24 inch x 12 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910210	Sign Type P-2, 24 inch x 18 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910215	Sign Type P-2, 24 inch x 30 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910218	Sign Type P-2, 30 inch x 18 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			

#	028910220	Sign Type P-2, 30 inch x 24 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910225	Sign Type P-2, 30 inch x 30 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910230	Sign Type P-2, 36 inch x 36 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910235	Sign Type P-2, 48 inch x 48 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910236	Sign Type P-2, 60 inch x 18 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910237	Sign Type P-2, 96 inch x 18 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			
#	028910238	Sign Type P-2, 24 inch x 24 inch	Each
Includes frame or “Z” bar as required as per Standard Drawing SN Series			

PROPOSAL FOR JANUARY 1, 2008

PROPOSED ADDITIONS TO M & P: Sign Bases and Posts

#		Small Sign Tubular Steel Post Base (B1)	Each
Includes installation of socket, wedge and concrete foundation as per Std. Dwg. SN Series			

#		Small Sign Tubular Steel Post Base (B2A)	Each
Includes installation of drivable socket and wedge as per Std. Dwg. SN Series			

#		Small Sign Tubular Steel Post Base (B2B)	Each
Includes installation of socket, wedge, concrete foundation and core drilling as required per Std. Dwg. SN Series			

#		Slipbase Sign Base with top casting SLB-1 (B3)	Each
Includes installation of top casting, stub base, concrete foundation and core drilling as required per Std. Dwg. SN Series			

#		Slipbase Sign Base with top casting SLB-2 (B3)	Each
Includes installation of top casting, stub base, concrete foundation and core drilling as required per Std. Dwg. SN Series			

#		Slipbase Tubular Steel Sign Base Surface Mounted top casting SLB-2 (B4A)	Each
Includes installation of top casting, base plate and hardware for mounting, as required per Std. Dwg. SN Series			

#		Tubular Steel Sign Base Surface Mounted (B4BA)	Each
Includes installation of casting, hardware for mounting, as required per Std. Dwg. SN Series			

#		Constant Slope Barrier Top Mount Slipbase Tubular Steel Sign Base (B5A)	Each
Includes installation of top casting, barrier plate with stub and hardware as required per Std. Dwg. SN Series			

#		Standard Section Barrier Top Mount Slipbase Tubular Steel Sign Base (B5B)	Each
Includes installation of top casting, barrier plate with stub and hardware as required per Std. Dwg. SN Series			

#		Sign Post Base (B6A) for Std. Pipe Posts	Each
Includes incline base, installation of concrete foundation and hardware to mount base to post as per Std. Dwg. SN Series			

#		Sign Post Base (B6B) for S & W Section Steel Posts	Each
Includes base, installation of concrete foundation and hardware to mount base to post as per Std. Dwg. SN Series			
#		Sign Post P1	Each
Includes post and all hardware to mount sign to post as per Std. Dwg. SN Series			
#		Sign Post P2	Each
Includes post and all hardware to mount sign to post as per Std. Dwg. SN Series			
#		Sign Post P3	Each
Includes post and all hardware to mount sign to post as per Std. Dwg. SN Series			
#		Sign Post P4	Each
Includes post and all hardware to mount sign to post as per Std. Dwg. SN Series			
#		Sign Post P5	Each
Includes post and all hardware to mount sign to post as per Std. Dwg. SN Series			
#		“T” Bracket Extension	Each
As per Std. Dwg. SN Series			
#		“U” Bracket Extension	Each
As per Std. Dwg. SN Series			
#		Extension	Each
As per Std. Dwg. SN Series			
#		90° Post Extension	Each
As per Std. Dwg. SN Series			
#		Post S3 x 5.7	Each
Includes post, post to base connection plate, fuse and splice plates, and all hardware to mount sign to post as per Std. Dwg. SN series			

#		Post S4 x 9.5	Each
Includes post, base to post connection plate, fuse and splice plates, and all hardware to mount sign to post as per Std. Dwg. SN series			
#		Post S6 x 12.5	Each
Includes post, post to base connection plate, fuse and splice plates, and all hardware to mount sign to post as per Std. Dwg. SN series			
#		Post S6 x 17.5	Each
Includes post, post to base connection plate, fuse and splice plates, and all hardware to mount sign to post as per Std. Dwg. SN series			
#		Post S8 x 18.4	Each
Includes post, post to base connection plate, fuse and splice plates, and all hardware to mount sign to post as per Std. Dwg. SN series			
#		Post W10 x 19.0	Each
Includes post, post to base connection plate, fuse and splice plates, and all hardware to mount sign to post as per Std. Dwg. SN series			
#		Post W10 x 22.0	Each
Includes post, post to base connection plate, fuse and splice plates, and all hardware to mount sign to post as per Std. Dwg. SN series			
#		Post W10 x 26.0	Each
Includes post, post to base connection plate, fuse and splice plates, and all hardware to mount sign to post as per Std. Dwg. SN series			
#		Post W10 x 30.0	Each
Includes post, post to base connection plate, fuse and splice plates, and all hardware to mount sign to post as per Std. Dwg. SN series			
#		Post 3" Std. Pipe	Each
Includes post, inclined post to base connection plate and all hardware to mount sign to post as per Std. Dwg. SN series			
#		Post 4" Std. Pipe	Each
Includes post, inclined post to base connection plate and all hardware to mount sign to post as per Std. Dwg. SN series			

#		Post 5" Std. Pipe	Each
Includes post, inclined post to base connection plate and all hardware to mount sign to post as per Std. Dwg. SN series			
#		Post 6" Std. Pipe	Each
Includes post, inclined post to base connection plate and all hardware to mount sign to post as per Std. Dwg. SN series			
#		Post 8" Std. Pipe	Each
Includes post, inclined post to base connection plate and all hardware to mount sign to post as per Std. Dwg. SN series			

Region 4 Design Specification Review

Section 02891: Traffic Signs

Submitted: 10/1/07

Prepared by: Jared Beard

Reviewed by: Jared Dastrup

General Comments

1. **Suggestion:** Remove references to specific standard drawings in the specification and simply use a statement such as “per SN Series Standard Drawings” or simply “per Standard Drawings”. If a standard drawing changes in the future then the specification will need to be modified accordingly and become a supplemental or special provision. The general statement referring to the Standard drawings should be adequate.

This has been corrected.

2. **Suggestion:** Whenever you are giving a dimension that is less than zero it should be shown with a zero in front of the decimal place, i.e. (.095 should be shown as 0.095). There are several dimensions under Article 2.1, Paragraph E that should be updated for clarity. *Will be corrected.*

Specific Comments

Comments item 1 & 2. John and I had an extensive conversation concerning these items and conclude a CBA would be required as they both relate to one and other. As expressed in the submittal the current way of paying for sign installations does not lend itself to do a CBA very effectively.

Time is not available to do this work; if you have the time we would surly look at this again. Off the top retroreflective material is \$4.00 per sq. foot vs. 80 cents for non-reflective.

1. **Article 1.4, Paragraph D. Suggestion:** Remove the Legend section from this paragraph. Unless it can be shown that there is a significant cost difference between signs with a reflective legend vs. signs with a nonreflective legend there is no reason to define which type for the contractor. The contractor is already required to install the sign per the MUTCD which defines the reflectivity of the sign. There are also some signs that have both reflective and nonreflective lettering in the legend which is not addressed in the specification.
2. **Article 1.4, Paragraph D. Suggestion:** Simply designate signs as Aluminum or Plywood and drop the old designations of A1, A2, P1, and P2. This will cut the number of sign pay items in half, making some people in construction very happy. It will also eliminate confusion between a sign designation of P1 or P2 and post designation of P1 or P2 (believe it or not this has confused contractors before.)
In order not to confuse the contractor what if we go back to the PW for plywood or change the plywood designation to “W”. Let me know how you feel.

3. **Article 1.4, Paragraph F. Suggestion:** Remove the Auxiliary Sign item from the specification. The item reads exactly the same as the Sign item. The new method of calling out signs and posts separately eliminates the need to have a separate item for auxiliary signs. Now we can simply call out two signs on one post. We show the sign configuration on the plans so there should be no confusion about how the signs are placed. *Thanks, you are right, will be removed, will remove from M & P also.*
4. **Article 1.5, Paragraph B. Suggestion:** Remove the Auxiliary Sign item for the same reasons listed above. *Thanks, you are right, will be removed.*
5. **Article 2.1, Paragraph B. Suggestion:** Instead of just “Substrate” refer to it as “Substrate (Aluminum)”. This change clarifies what the paragraph is referring to and matches the definition give for substrate in Article 1.4, Paragraph A. *Will correct to your verbiage.*
6. **Article 2.1, Paragraph C. Suggestion:** Instead of just “Plywood” refer to it as “Substrate (Plywood)”. This change clarifies what the paragraph is referring to and matches the definition give for substrate in Article 1.4, Paragraph A. *Will correct to your verbiage.*
7. **Article 2.1, Paragraph D, Subparagraph 4. Question:** Is the designer required to define the SLB-1 or SLB-2 top casting type or does it matter what top casting type is used for these bases? If the designers are required to call this out then more detail is needed in either specification or standard drawing detailing when you should use one or the other. *This is called out on SN 10A, and has been more clearly define on revisions made to SN 10A base on yours and other comments. I have attached an updated draft look at it and see if that is enough for you.*
8. **Article 2.1, Paragraph H. Question:** Which foundation is this referring to? Does this only refer to the freeway foundations or does this also refer to other foundations with concrete bases? This should be clarified. *Added verbiage: Foundation: As specified on applicable standard drawing.*

Standard Drawing/Specification Review Sheet			Review Comments		
Std Dwg/Spec Number	Std. Spec 02891 & M&P		Sheet 1	of	3
Date:			Facilitator:	Glenn Schulte	

Review Comments Form

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
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1
as of
10/3/07

Those listed in below deleted the email with no comments.
I can only assume they looked at the material and had no comments.

Bill Smith, Glen Ames, Kelly Barreett
Kris Peterson, Nathan Lee, Norton
Thurgood, Stan Burns, Barry Sawasak,
Bill Lawrence, Dave Nazare, Joe
Kammerer, John Higgins, John Clarkson
Josh VanJura, Randy Park, Richie
Taylor, Robert Westover, Eric Rasband,
Kathy Ryan, Layne Slack, Pat McGann,
Rick Torgerson, Teri Peterson, Cory
Pope, Darin Fristrup, David Adamson,
Mike Cuthbert, A.J. Rogers, Cameron
Kergaye, Jack Lyman, Lori Dabling,
Merrell Jolley, Daryl Friant, Jim
McConnell, Kim Manwill, Tommy
Vigil, Scott Jones, Lonnie Marchant,
Scott Andrus, Steve Bonner, Dave
Kennecom, Marsha Chaston, Russ
Tangren, Evan Sullivan, M.
Kaczorowski, S. Niebergall, Betty
Purdie, Lisa Wilson, Robert Markle, T.
Newell, Val Stoker, Carl Johnson
Dal Hawks, Dan Webster, Eric
Brondum, George Leighton, Les Henrie,
Lyndon Friant, Nancy Jerome, Robert
Dowell, Steve Ogden

			An additional 53 were sent emails and did not reply		
			Response:		

2	Brian Phillips		Reviewed with no comments back		
			Response:		

3	Barry Sawsak		No comments		
			Response:		

4	Doug Bassett		No comments, praised committee's work		
			Response:		

5	Barry Axelrod		Comments in the way SN drawing are called out in spec. Suggested change in verbiage		
			Response: comments reviewed and verbiage change made to be consistent with other specifications.		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet			Review Comments		
Std Dwg/Spec Number	Std. Spec 02891 & M&P		Sheet 2	of	3
Date:			Facilitator:	Glenn Schulte	

6	Todd Richins		No comments, praised committee's work		
			Response:		

7	Tim Beil		No comments		
			Response:		

8	Brent Schvaneveldt		No comment		
			Response:		

9	Pat McGann		No comments, Thanked Review Committee		
			Response:		

10	Nathan Peterson		I looked through all of these, no comment, I just don't know enough about signs.		
			Response: thanked for the effort		

11	Jason Davis		No comments OK		
			Response:		

12	Mike Miles		No Comment		
			Response:		

13	Robert Markle		No Comments		
			Response:		

14	Fred Jenkin		Concerns about additional pay items		
			Response: explained how the additions were arrived at.		

15	Cris Cowans		Thanked the committee for a good job.		
			Response:		

16	Dave Babcock		Concurred with the explanation to Fred Jenkins. Thanked committee for the work.		
			Response:		

17	Scott Nussbaum		"I'm afraid I'll have to leave the review of these to the rest of the capable bunch."		
			Response:		

18	Mont Wilson		Verbal conversation, had some concerns about additional pay item but felt the contractor could work with them.		
			Response:		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet			Review Comments		
Std Dwg/Spec Number	Std. Spec 02891 & M&P		Sheet 3	of	3
Date:			Facilitator:	Glenn Schulte	

19	Rich Clarke		Spelling error		
			Response: corrected		

20	Roland Stanger		Verbal response technical errors		
			Response: responded		

21	R4 Design Squad		Written comments		
			Response: addressed		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Supplemental Specification
~~20085 Standard Specification Book~~

SECTION 02891

TRAFFIC SIGNS

~~Delete Section 02891 in its entirety and replace with the following:~~

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Materials and procedures for installing traffic signs.

1.2 RELATED SECTIONS

- A. Section 02317: Structural Excavation
- B. Section 03055: Portland Cement Concrete
- C. Section 03211: Reinforcing Steel and Welded Wire
- D. Section 05120: Structural Steel

~~E. Section 06055: Timber and Timber Treatment~~

1.3 REFERENCES

~~A. ASTM A 153: Zinc Coating (Hot Dip) on Iron and Steel Hardware~~

~~B. ASTM A 314: Stainless Steel Billets and Bars for Forging~~

~~C. ASTM A 500: Cold-Formed Welded and Seamless Carbon Steel Structural
Tubing in Rounds and Shapes~~

~~DA.~~ ASTM A 513: Electric-Resistance-Welded Carbon and Alloy Steel Mechanical
Tubing

~~EB.~~ ASTM A 653: Steel, Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated
(Galvannealed) by Hot-Dip Process

~~FC.~~ ~~ASTM A 1011: Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability~~

~~GD.~~ ASTM B 209: Aluminum and Aluminum-Alloy Sheet and Plate

~~HE.~~ American Plywood Association (APA) Product Standard

~~HF.~~ Code of Federal Regulations (CFR)

1.4 TRAFFIC SIGN COMPONENTS

- A. Substrate: The base material, usually plywood or aluminum, upon which the background sheeting is attached.
- B. Sheeting: The retroreflective or non-reflective material that comprises the background, legend (word messages and symbols), and border.
- C. Sheeting Components: The matched component products required for the manufacture of highway signs will consist of the sheeting, cutout letters and borders, adhesives, inks and overlay films. Failure of the sheeting inks or overlay films, provided, sold, or recommended for use, will constitute a failure of the entire sign and be replaced under manufacturer's warranty replacement obligations. All components and warranties will be compatible with substrates used by UDOT, including 90/90 HDO plywood and Aluminum ASTM B 209 5052 - H 38 or 6061-T6.
- D. Panel: Assembly of substrate and attached sheeting. Several panels may be necessary to complete one sign. Panel types are:
1. Type
 - a. A: Retroreflective sheeting on sheet aluminum.
 - b. ~~P:~~ W or PW Retroreflective sheeting on plywood.
 2. Legend:
 - a. 1: With non-reflective legend, symbols, and borders.
 - b. 2: With retroreflective legend and border.
- E. Sign: ~~An complete-assembly comprised of panel, panel with frame when required, panel with "Z" bar when required, post, frame, and panel.~~
- ~~F.~~ ~~Auxiliary Sign: A sign including frame, if required, attached and supplemental to a complete sign assembly.~~
- ~~G-F~~ Panel replacement: Removing the existing panel and attaching a new panel to the frame.
- ~~H-G~~ Panel Overlay: Attaching new panels to all or part of an existing panel.

~~L~~H Size: Height x Width~~Horizontal~~ x ~~vertical~~

1.5 SIGN CODES

- A. New Sign: N
- B. Auxiliary Sign: Aux
- C. Relocation: R
- D. Removal: X
- E. Panel Replacement: PR
- F. Panel Overlay: PO

1.6 SUBMITTALS

- A. Submit three sets of drawings for overhead structures for prefabrication approval. Allow 14 calendar days for approval.
- B. Manufacturer's Product Data and Specifications.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Fabricate signs and posts as specified per SN Series Standard Drawings.
- B. Substrate Aluminum: 0.080 inch thick. ASTM B 209 alloy 6061-T6, or 5052-H38.
- C. Substrate Plywood: as specified below and which meets the APA product standard 1 PSI-83, Group 1, ⁵/₈ inch thick.
 - 1. 90/90, high density BB exterior (Douglas Fir) B Grade.
 - 2. Plugged-core (Douglas Fir) with ½ inch maximum gaps.
 - 3. Use acrylic laminate that is compatible with the retroreflective sheeting adhesive, and that does not require the removal of the release agents before applying the sheeting.

- D. Bases: as per SN Series Standard Drawings-SN-series
1. Small Sign Tubular Steel Sign Base (B1)
 - a. Manufactured as per Standard Drawing
 - b. Concrete foundation as per Standard Drawing
 2. Small Sign Tubular Steel Sign Base (B2A)
 - a. Manufactured as per Standard Drawing
 3. Small Sign Tubular Steel Post Base (B2B)
 - a. Manufactured as per Standard Drawing
 - b. Concrete foundation as per Standard Drawing
 4. Slipbase Tubular Steel Sign Base (B3)
 - a. Manufactured as per Standard Drawing
 - 1) SLB-1 Slipbase top casting with locking ring.
 - 2) SLB-2 Slipbase top casting with set screws.
 - b. Concrete foundation as per Standard Drawing
 5. Slipbase Tubular Steel Sign Base Surface Mounted (B4A)
 6. Tubular Steel Sign Base Surface Mounted (B4B)
 7. Slipbase Tubular Steel Sign Base Barrier Mounted (B5)
 8. Freeway Sign Base
 - a. Pipe Posts (B6A)
 - 1) Match base size with post size
 - b. S Section post (B6B)
 - 1) Match base size with post size
 - c. W Section post (B6C)
 - 1) Match base size with post size
 - d. Concrete foundations as per Standard Drawing
- E. Posts, "T", "U" brackets, extensions and hardware: as per SN Series sStandard Drawings-SN-series
1. Post P1:
 - a. 2³/₈" outside diameter 0.080 (14 Gauge)
 - b. ASTM A 513
 - c. Galvanize to ASTM A 653
 - d. Color: Powder coated as required
 2. Post P2:
 - a. 2³/₈" outside diameter 0.095 (13 Gauge)
 - b. ASTM A 513
 - c. Galvanize to ASTM A 653
 - d. Color: Powder coated as required
 3. Post P3
 - a. 2⁷/₈" outside diameter 0.134 (BWG 10)
 - b. ASTM A 513
 - c. Galvanize to ASTM A 653
 - d. Color: Powder coated as required
 4. Post P4
 - a. 2⁷/₈" outside diameter 0.160 (NP 40)

- b. ASTM A 513
 - c. Galvanize to ASTM A 653
 - 5. Post P5
 - a. 2 7/8" outside diameter 0.276 (SCH. 80)
 - b. ASTM 500
 - c. Galvanize to ASTM A-123
 - 6. "T", "U", Extension and 90° Post Extension
 - a. Manufacture as per ~~Standard Drawings~~Std. Dwg.
 - b. Galvanize each
 - 7. S Section and W Section steel posts
 - a. Structural Steel: Refer to Section 05120.
 - b. Match post size with base requirements
- D. Posts:
 - 1. Timber Sign Post (P1)
 - a. Refer to Section 06055
 - 2. Tubular Steel Sign Post (P2)
 - a. Post: ASTM A 513
 - b. Finish: Galvanize ASTM A 653
 - c. Shape: As shown, wall thickness 0.080
 - d. Color: Powder coated as required
 - 3. Square Steel Sign Post (P3)
 - a. Post: ASTM A 1011 Grade 50
 - b. Finish: Galvanize ASTM A 653
 - c. Shape: 12 gauge or 10 gauge steel
 - d. Color: Powder coated as required
 - 4. Slip Base Tubular Steel Sign Post (P4)
 - a. Post ASTM A 500 Grade C; 46,000 psi minimum yield
 - b. Finish: Galvanize ASTM A 153
 - c. Shape: As shown; schedule 80
 - d. Color: Powder coated as required
 - 5. Steel Sign Post (P5)
 - a. Refer to Section 05120
- E. Retroreflective Sheeting:
 - 1. Meet Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects FP-03.
 - 2. Conform to 23CFR655 Subpart F for Standard Highway colors for Ordinary and Fluorescent Sheeting.
 - 3. Meet or exceed the minimum requirements of ASTM Type IX.
- F. Non-reflective Sheeting: As specified and in accordance with the recommendation of the retroreflective sheeting manufacturer.
- G. Fasteners: As ~~specified required~~ Meet ASTM A 314, Class 304, 18-8, Stainless Steel, on applicable SN Series Standard Drawings ~~SN series~~

- H. Foundation: as required on applicable SN Series Standard Drawing ~~SN-series~~
 - 1. Concrete: Class A (AE). Refer to Section 03055.
 - 2. Reinforcing steel: Refer to Section 03211.
 - 3. Anchor bolts: Refer to Section 05120.
- I. Structural Steel: Structural Steel frame. Refer to Section 05120.
- J. Temporary covering: Opaque material.

PART 3 EXECUTION

3.1 PREPARATION

- A. Coordinate utility location.
- B. Excavate: Refer to Section 02317.
- C. Install traffic control devices before work activities begin.

3.2 INSTALLATION - GENERAL

- A. Do not reverse screen sign larger than 7 ft²/color.
- B. Do not remove a sign that is being replaced until the new sign is placed and uncovered.
- C. Compact backfill to a density equal to surrounding materials.
- D. Establish proper elevation and orientation of all signs and structures, and determine proper sign post lengths as dictated by construction slopes.
- E. Cover signs that require temporary covering with an opaque material. Secure at the rear of the sign so that the sign is not damaged. Maintain covering until covering or sign is removed.
- F. Construct sign post foundations with concrete conforming to indicated dimensions.

3.3 RELOCATING EXISTING SIGN

- A. Retrofit as required to meet current standards.

- B. Provide new posts and accessories as required.
- C. Remove foundations to a minimum of 6 inches below the ground line, and backfill.

3.4 REMOVING EXISTING SIGN

- A. Remove foundations to a minimum of 6 inches below the ground line and backfill.

END OF SECTION

Standards Committee Submittal Sheet

Name of preparer: Wes Starkenburg
Title/Position of preparer: Operations Design Engineer
Specification/Drawing/Item Title: ST 1 Object Markers "T" Intersection
And Pavement Transition Guidance
St 5 Painted Median and
Auxiliary Lane Details
Specification/Drawing Number: ST 1, ST 5

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

ST 1 – Deleted OM-3C, OM-3R, OM-3L, Substituted Standard MUTCD signs
Revised T intersection guidance to allow for urban and rural
Added note re T intersection advance warnings
Deleted barrier markers

ST 5 – Updated pavement markers

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No change to measurement and payment

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

Mont Wilson responded with "no comment"

ACEC Comments: (Use as much space as necessary.)

After 2 requests I have no received comments form ACEC

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

See attached distribution list

Construction Engineers

See attached distribution list

Contractors (Any additional contacts beyond "C" above.)

Minimal effect on contractors. Contacted AGA only

Suppliers

These changes have no significant effect on suppliers

Consultants (as required) (Any additional contacts beyond "C" above.)

Contacted ACEC only

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

FHWA worked with us while making proposed changes and has been included in this current review.

Others (as appropriate)

None

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

No significant changes to measurement and changes

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

No changes to business systems

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Will be included in publication of next (2008) changes to standards

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

No anticipated changes to bid item price

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

Should decreased maintenance costs due to reduced striping requirements.

3. Life cycle cost.

Life cycle costs should be reduced slightly due to reduced striping costs

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.)
(Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Brings these UDOT Standard Drawing into conformance with current standards

- H. Safety Impacts?

Should increase safety as striping is brought up to current standards

- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

No recent history

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

Subject: Std Dwg ST 1, ST 5
 Created By: WSTARKENBURG@utah.gov
 Scheduled Date:
 Creation Date: 9/18/2007 3:28 PM
 From: Wes Starkenburg

Recipient	Action	Date & Time	Comment
To: A J Rogers (AJROGERS)	Read	9/19/2007 4:53 PM	
To: Anne Ogden (ANNEOGDEN)	Read	9/25/2007 6:18 PM	
To: Anthony Sarhan (anthony.sarhan)	Transferred	9/18/2007 3:29 PM	
CC: Barry Axelrod (BAXELROD)	Read	9/18/2007 4:24 PM	
To: Barry Sawsak (BSAWSAK)	Read	9/19/2007 6:30 AM	
To: Bill Lawrence (BILLLAWRENCE)	Read	9/19/2007 6:32 AM	
To: Bill Smith (BILLSMITH)	Read	9/19/2007 7:08 AM	
To: Boyd Wheeler (BWHEELER)	Read	9/18/2007 6:36 PM	
To: Brent Christensen (BCHRISTENSEN)	Transferred	9/18/2007 3:28 PM	
To: Brent Schvaneveldt (BSCHVANEVELDT)	Read	9/19/2007 7:59 AM	
To: Carrie Jacobson (CIJACOBSON)	Read	9/19/2007 10:48 AM	
To: Dale Stapley (DSTAPLEY)	Read	9/19/2007 6:54 AM	
To: Danielle Herrscher (DANIELLEHERRSCHER)	Read	9/20/2007 8:56 AM	
To: Darin Duersch (DDUERSCH)	Delivered	9/18/2007 3:28 PM	
To: Darren Rosenstein (DROSENSTEIN)	Read	9/19/2007 8:51 AM	
To: Dave Babcock (DBABCOCK)	Read	9/18/2007 3:50 PM	
To: Dave Kinnecom (DKINNECOM)	Read	9/19/2007 8:09 AM	
To: Deryl Mayhew (DMAYHEW)	Delivered	9/18/2007 3:28 PM	
To: Doug Bassett (DBASSETT)	Read	9/19/2007 5:21 PM	
To: Eric Rasband (ERASBAND)	Read	9/18/2007 3:32 PM	
To: Erik Brondum (EBRONDUM)	Transferred	9/18/2007 3:28 PM	
To: Ervan Rhoades (ERHOADES)	Read	9/18/2007 8:46 PM	
To: Evan Sullivan (EVANSULLIVAN)	Read	9/18/2007 3:44 PM	
To: Fred Jenkins (FJENKINS)	Read	9/19/2007 8:01 AM	
To: Glen Ames (GLENAMES)	Read	9/18/2007 3:38 PM	
To: Glenn Schulte (GSCHULTE)	Read	9/18/2007 3:35 PM	
To: Greg Searle (GSEARLE)	Read	9/19/2007 6:33 AM	
To: Jack Lyman (JACKLYMAN)	Read	9/18/2007 4:22 PM	
To: Jack Mason (JMMASON)	Read	9/19/2007 7:02 AM	
To: Jim Golden (JIMGOLDEN)	Read	10/2/2007 1:32 PM	
To: Joe Kammerer (JKAMMERER)	Read	9/19/2007 8:29 AM	
To: John Leonard (JLEONARD)	Read	10/1/2007 5:02 PM	
To: Josh VanJura (JVANJURA)	Read	9/18/2007 3:36 PM	
To: Justin Sceili (JSCEILI)	Read	9/19/2007 7:56 AM	
To: Kelly Barrett (KBARRETT)	Read	9/18/2007 3:33 PM	
To: Kevon Ogden (KEVONOGDEN)	Read	9/18/2007 4:07 PM	
To: Kris Peterson (KRISPETERSON)	Delivered	9/18/2007 3:28 PM	
To: Larry Montoya (LMONTOYA)	Read	9/20/2007 8:54 AM	
To: Layne Slack (LSLACK)	Read	9/19/2007 8:55 AM	
To: Les Henrie (LHENRIE)	Read	9/26/2007 5:25 PM	
To: Lonnie Marchant (LMARCHANT)	Read	9/18/2007 3:37 PM	
To: Lyndon Friant (LFRIANT)	Read	9/18/2007 3:56 PM	
To: Mark Velasquez (MVELASQUEZ)	Read	9/18/2007 4:49 PM	
To: Marsha Chaston (MARSHA)	Read	9/18/2007 4:26 PM	
To: Marwan Farah (MFARAH)	Read	9/19/2007 8:54 AM	
To: Merrell Jolley (MERRELLJOLLEY)	Read	9/24/2007 1:02 PM	
To: Michael Cuthbert (MBCUTHBERT)	Read	9/18/2007 3:28 PM	
To: Michael Kaczorowski (MKACZOROWSKI)	Read	9/19/2007 10:14 AM	
To: Michelle Page (MICHELLEPAGE)	Read	9/19/2007 10:00 AM	
To: Mike Donovan (MDONIVAN)	Read	9/18/2007 3:31 PM	
To: Mike Miles (MMILES)	Read	9/19/2007 11:06 AM	
To: Mike Seng (MSENG)	Delivered	9/18/2007 3:28 PM	
To: Mont Wilson (mont.wilson)	Transferred	9/18/2007 3:28 PM	
To: Nancy Jerome (NJEROME)	Read	9/19/2007 9:04 AM	

To: Nathan Lee (NLEE)	Read	9/18/2007 3:37 PM
To: Nathan Peterson (NATEPETERSON)	Read	9/19/2007 9:46 AM
To: Nick Peterson (NPETERSON)	Read	9/19/2007 9:12 AM
To: Norton Thurgood (NTHURGOOD)	Read	9/19/2007 4:14 PM
To: Patrick McGann (PMCGANN)	Read	9/24/2007 11:54 AM
To: Randy Park (RPARK)	Delivered	9/18/2007 3:28 PM
To: Ree Schena (RSCHENA)	Read	9/18/2007 3:45 PM
To: Rex Harris (REXHARRIS)	Delivered	9/18/2007 3:28 PM
To: Richard Clarke (RICHARDCLARKE)	Read	9/19/2007 12:06 PM
To: Rick Debban (RDEBBAN)	Read	9/19/2007 8:35 AM
To: Rick Torgerson (RTORGERSON)	Delivered	9/18/2007 3:28 PM
To: Rob Clayton (ROBERTCLAYTON)	Read	9/18/2007 4:57 PM
To: Robert Hull (RHULL)	Delivered	9/18/2007 3:28 PM
To: Robert Markle (RMARKLE)	Read	9/25/2007 7:30 AM
CC: Robert Miles (ROBERTMILES)	Read	9/18/2007 3:39 PM
To: Robert Nebeker (RNEBEKER)	Read	9/20/2007 8:14 AM
CC: Roland Stanger (Roland.Stanger)	Transferred	9/18/2007 3:29 PM
To: Rukhsana Lindsey (RLINDSEY)	Delivered	9/18/2007 3:28 PM
To: Russ Tangren (RTANGREN)	Read	9/19/2007 9:34 AM
To: Scott Snow (SCOTTSNOW)	Read	9/19/2007 11:23 AM
To: Stan Burns (SBURNS)	Read	9/19/2007 9:51 AM
To: Steve Kunzler (SKUNZLER)	Delivered	9/18/2007 3:28 PM
To: Steven Acerson (SACERSON)	Read	9/18/2007 4:38 PM
To: Steven Niebergall (SNIEBERGALL)	Read	9/18/2007 3:34 PM
To: Teri Peterson (TERIPETERSON)	Read	9/18/2007 4:43 PM
To: Tim Biel (TBIEL)	Read	9/18/2007 3:30 PM
To: Todd Richins (TLRICHINS)	Read	9/24/2007 10:34 AM
To: Tommy Vigil (TOMMYVIGIL)	Read	9/25/2007 7:13 PM
To: Troy Peterson (TLPETERSON)	Read	9/18/2007 4:17 PM
To: Troy Torgersen (TTORGERSEN)	Read	9/23/2007 6:32 PM
To: Tyler Yorgason (tyorgason)	Transferred	9/18/2007 3:28 PM
To: Val Stoker (VSTOKER)	Read	9/26/2007 8:34 AM
To: W. Scott Jones (WSJONES)	Read	9/18/2007 5:42 PM
BC: Wes Starkenburg (WSTARKENBURG)	Read	9/18/2007 3:28 PM

Std Dwg/Spec Number	ST 1, ST 5	Sheet 1	of	4
Date:	9/19/07	Facilitator:	Wes Starkenburg	

Review Comments Form

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
1	Fred Jenkins	ST 1	Note 4, Change Traffic Region Engineer to Region Traffic Engineer	A	A
			Response: Good Comment, how did we all miss it?		
2	Mike Miles	ST 5	Use rumble strips at solid yellow lines?	C	C
			Response: No, use strips in special apps only		
3	Nathan Petersen	ST 1	Give location of W2-4 sign	C	C
			Response: Use MUTCD		
4	Danielle Herrscher	ST 1	Show dimensions of object marker panels	C	C
			Response: No these are standard highway signs with standard dimensions		
5	Danielle Herrscher	ST 1	Use large gap between W1-7 and W1-8	C	C
			Response: No we are trying to reduce the size of this monster array		
6	Danielle Herrscher	ST 5 a	b1 Show distance from crosswalk to stop bar	A	A
			Response: Done		
7	Danielle Herrscher	ST 5 b 1	Show right turn arrows in all right turn pockets	B	C
			Response: No, placing arrows in ALL turn pockets is not required by MUTCD, diverts a lot of funds from other projects and requires expensive maintenance		
8	Danielle Herrscher	St 5 b 2	Use R3-7R if and only if mandatory right	A	A
			Response: This is per MUTCD		
9	Danielle Herrscher	ST 5 c 1	Note 3 remove section discussing "ONLY" message	A	A
			Response: Done		
10	Danielle Herrscher	ST 5 c 2	Use R3-7R	B	A
			Response: Agree, Also add same for left turns		
11	Danielle Herrscher	ST 5 d 1	Make pavement messages mandatory for all left turn lanes	B	C
			Response: Are optional per MUTCD		
12	Danielle Herrscher	ST 5 d 2	Make pavement messages optional for two-way left turn lanes	A	A
			Response: Done		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet

Review Comments

Std Dwg/Spec Number	ST 1, ST 5	Sheet 2	of	4
Date:	9/19/07	Facilitator:	Wes Starkenburg	

13	Doug Bassett	ST 5	Correct Painted Left Turn Lane Response: Done	A	A
14	Doug Bassett	ST 5	Permissive Two-Way Left turns, Change dimension from out to out of yellow skip and yellow solid to 12" Response: Done	A	A
15	Patrick McGann	ST 1	RE Type Object Marker Why only P1 post shown? Response: P1 post is adequate, Larger post could be used at greater expense	C	C
16	Patrick McGann	ST 1	RE Type Object Marker What is B1 or B2 base on timber post? Response: Timber posts are eliminated. Use P1 (metal) post	C	C
17	Patrick McGann	ST 1	RE Type Object Marker What is depth of hole? Response: Shown on sign mounting plans	C	C
18	Anne Ogden	ST 1 a	Switch places with the object markers. They don't seem to be in a logical order. I would suggest putting the OM-3L on the left side of the diagram so it's obvious that it goes on the left side of the road when used. Response: Done	C	C
19	Anne Ogden	ST 1 b	What is the difference between the OM-3C and the "Type III Object Marker"? Why use two different terms? Response: OM's 3 are panels only for mounting directly to parapets, etc. TYPE III shows a stand along assembly on which to mount an OM-3 panel	C	C
20	Anne Ogden	ST 1 c	Why is Note 2 necessary? Can it be combined with Note 1? Response: A separate thought. Leave as is.	C	C
21	Anne Ogden	ST 1 d	Reword Note 4: The <i>Region</i> Traffic Engineer determines... Response: Done	A	A
22	Anne Ogden	ST 5 a	If you're going to show the icon for the R3-7R sign at the end of the right turn lane, it should be labeled and the other required R3-7R sign at the beginning of the taper needs to be added. Response: Will show extra sign and label both	A	A

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet

Review Comments

Std Dwg/Spec Number	ST 1, ST 5	Sheet 3	of	4
Date:	9/19/07	Facilitator:	Wes Starkenburg	

23	Anne Ogden	ST 5 b	Also Note 3 needs to be clarified that you can use the arrows without the message "ONLY" and without the two signs, but the message "ONLY" AND the two R3-7R signs are both/all required if one or the other is used for emphasis	C	C
			Response: MUTCD Section 2B.21 says R3-7 used for mandatory turn lanes. Signs should be accompanied by arrows, especially id traffic volumes are high...Section 2B.22 Says when a through becomes a mandatory turn arrows shall accompany signs. Figure 3B-22 shows "ONLY" always optional		

24	Anne Ogden	ST 5 c	There are no distances given for the arrows, the message "ONLY", the gap, etc on the turn lanes like there were on the old ST 5	C	C
			Response: Same markings exist		

25	Anne Ogden	ST 5d	Is there a minimum distance for the tangent section of the double yellow line on the "painted left turn lane" detail?	C	C
			Response: No		

26	Anne Ogden	ST 5 e	Also, is the tapered double yellow line that goes back over to the centerline after the taper mandatory or optional?	C	C
			Response: This has been removed		

27	Anne Ogden	ST 5 f	Also, there shouldn't be 4 lines shown at the centerline on the left side of the detail	A	A
			Response: This has been fixed		

28	Anne Ogden	ST 5 g	Put the "Crossing Allowed" and "Crossing Prohibited" notes closer to the yellow lines on the "Painted median" detail.	A	A
			Response: Will do		

29	Anne Ogden	ST 5 h	Why are the solid and broken yellow lines for the permissive lines a heavier weight than the others?	A	A
			Response: Have fixed this		

30	Brent Schvaneveldt	ST 1, 5	No comment	A	A

31	Joe Kammerer	ST 1, 5	No comment	A	A

32	Richard Clarke	ST 1, 5	No comment	A	A

33	Rick Debban	ST 1, 5	Looks good	A	A

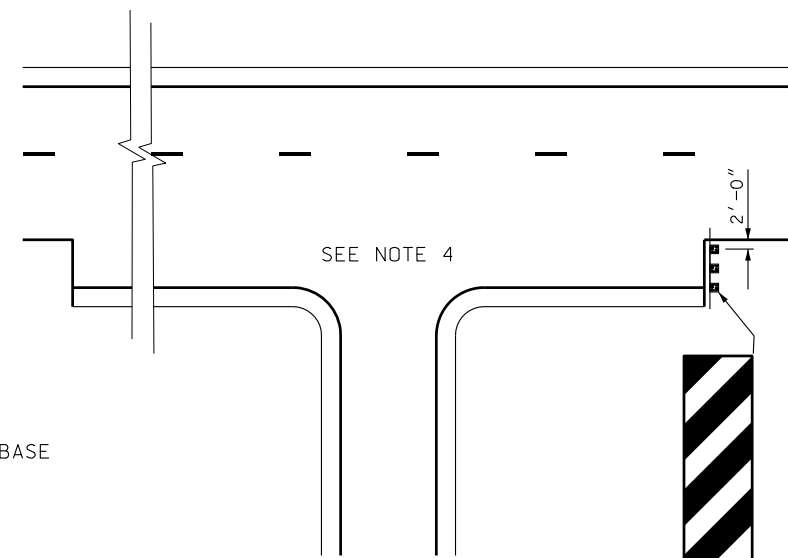
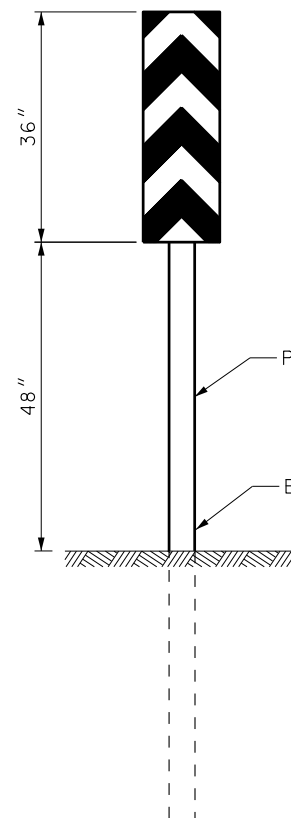
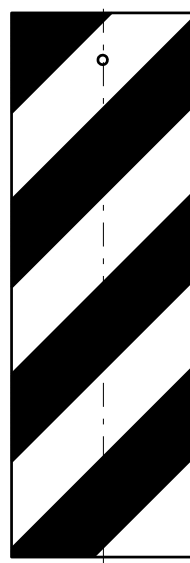
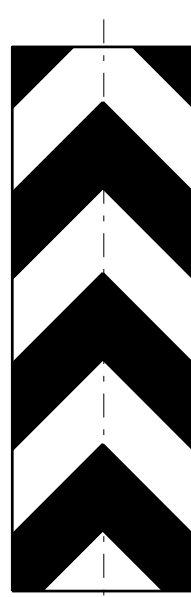
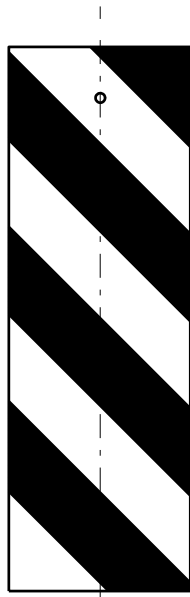
34	Robert Markle	ST 1, 5	No comment	A	A

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

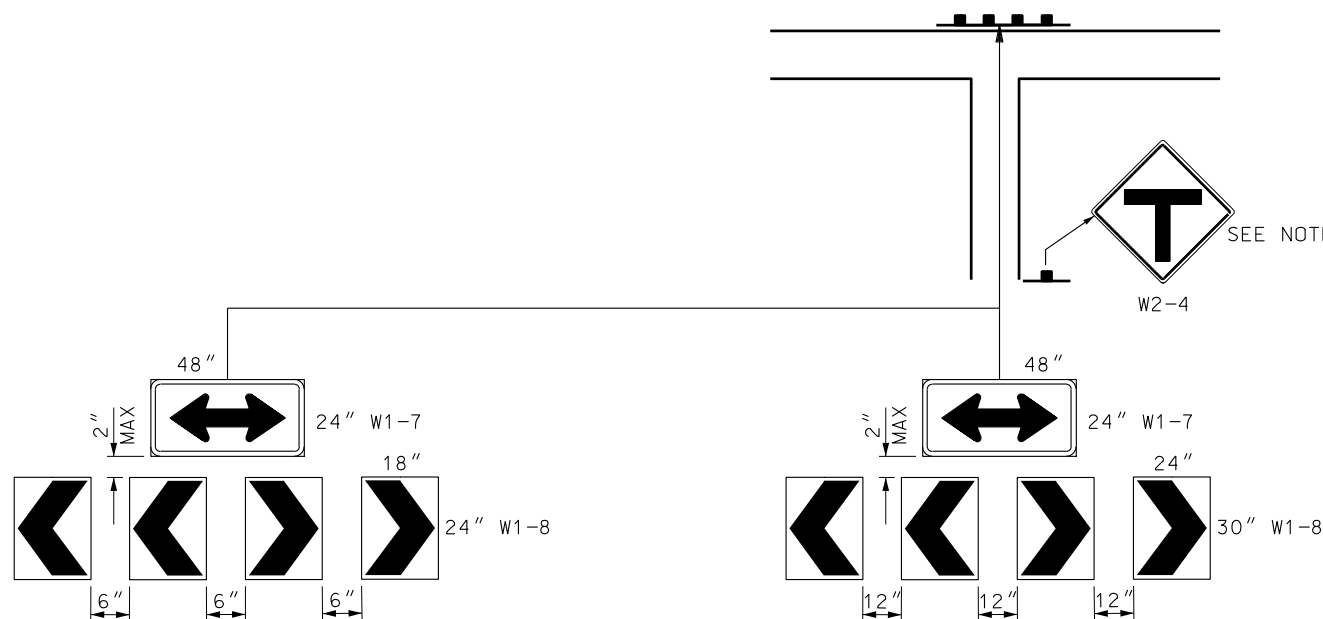
Standard Drawing/Specification Review Sheet		Review Comments		
Std Dwg/Spec Number	ST 1, ST 5	Sheet 4	of	4
Date:	9/19/07	Facilitator:	Wes Starkenburg	

35	Todd Richins	ST 1, 5	No comment	A	A
36					
37					
38					
39					
40					
41					
42					

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate



MINIMUM OF 3
OBJECT MARKERS (OM-3R)
ON 6' CENTERS



SEE STD DWG SN 12 A FOR POST SPACING
SEE STD DWG SN 7 A FOR SIGN MOUNTING HEIGHT

'T' INTERSECTION SIGNING

FOR URBAN INTERSECTIONS

- NOTES:

1. USE OM-3C, OM-3R, OR OM-3L TO MARK THE ENDS OF OBSTRUCTIONS SUCH AS NARROW BRIDGES, CULVERTS, ETC. FOR NARROW BRIDGES INSTALL THE MARKER ON EACH SIDE OF BOTH ENDS OF BRIDGE ON TWO-WAY ROADWAYS, AND ON EACH SIDE OF THE APPROACH END OF BRIDGE ON ONE-WAY ROADWAYS.
2. USE TYPE III, OBJECT MARKER TO MARK THE APPROACH TO THE ENDS OF BARRIERS THAT DO NOT HAVE AN ATTENUATOR OR END SECTION INSTALLED.
3. ATTACH SIGNS & OBJECT MARKERS TO POST WITH VANDAL RESISTANT FASTENERS.
4. THE REGION TRAFFIC ENGINEER DETERMINES PAVEMENT MARKINGS AND STRIPING FOR PAVEMENT TRANSITION.
5. USE 30" x 30" T-INTERSECTION SIGNS (W2-4) IF NOT CONTROLLED. IF CONTROLLED BY SIGNAL, STOP OR YIELD SIGN USE APPROPRIATE 36" x 36" ADVANCE TRAFFIC CONTROL SIGN (W3-1, W3-2 OR W3-3).

[illegible]

~~UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION~~

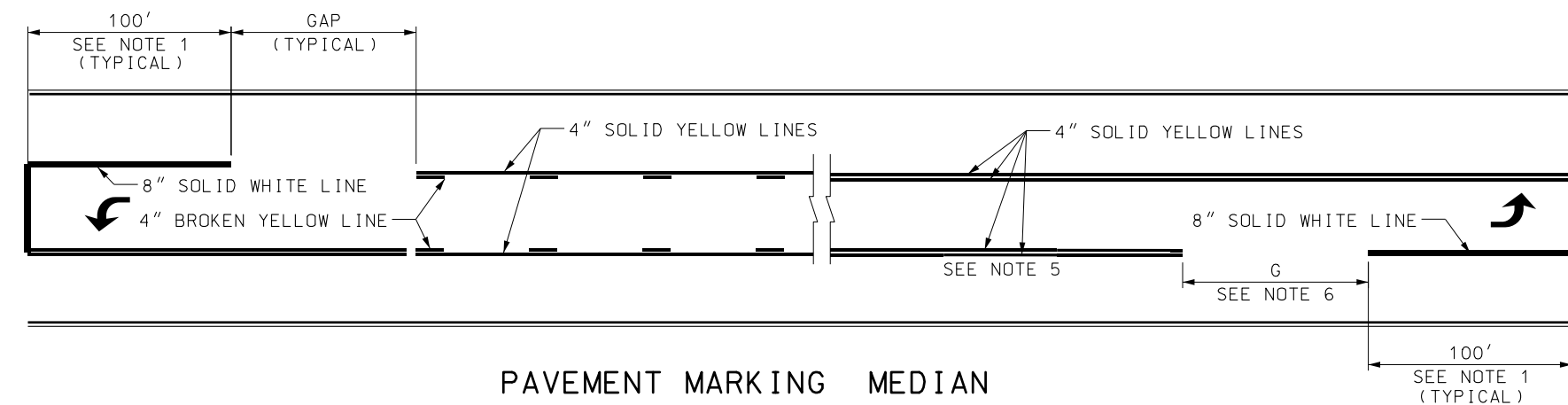
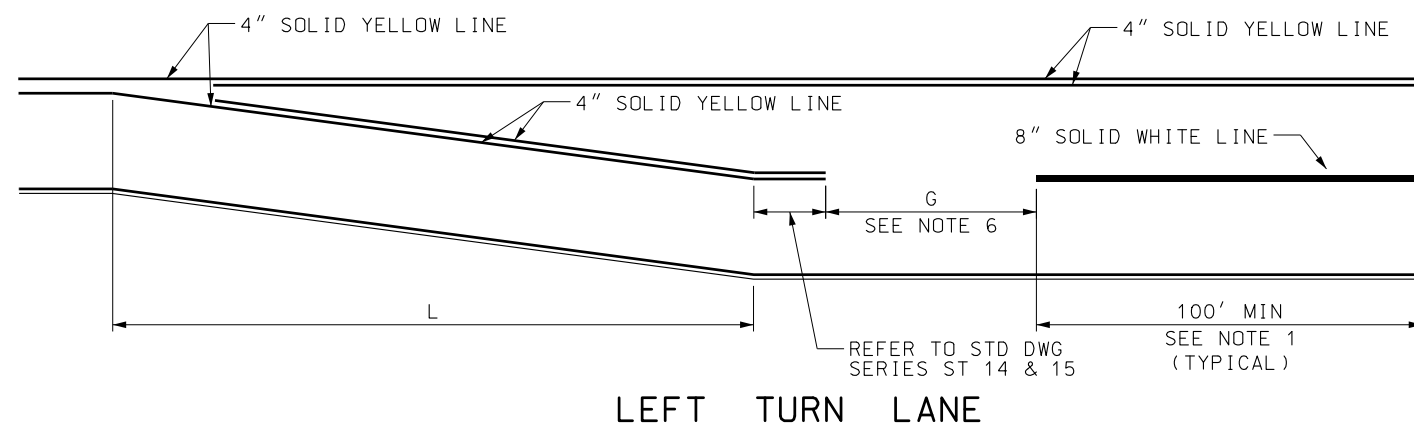
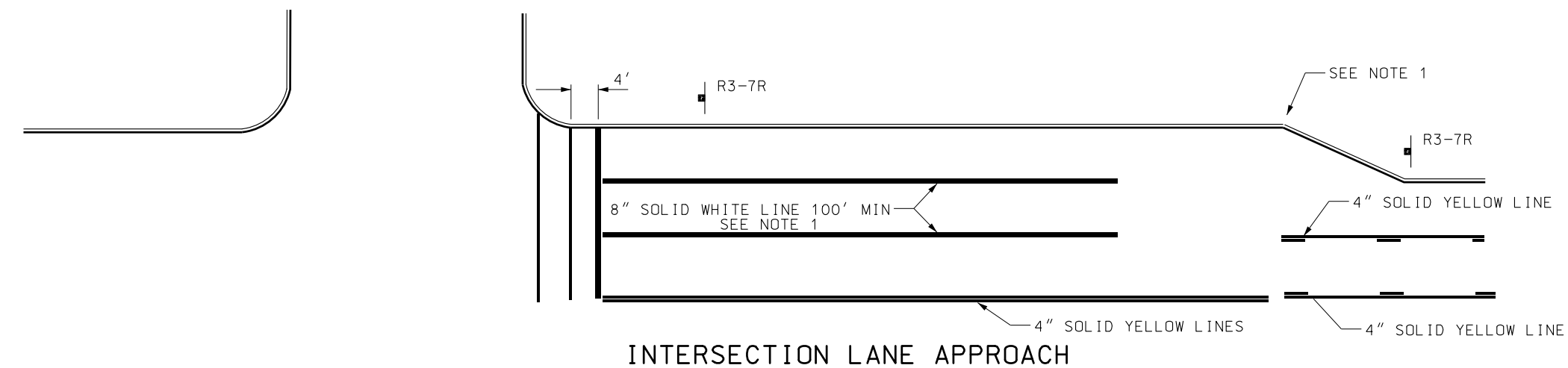
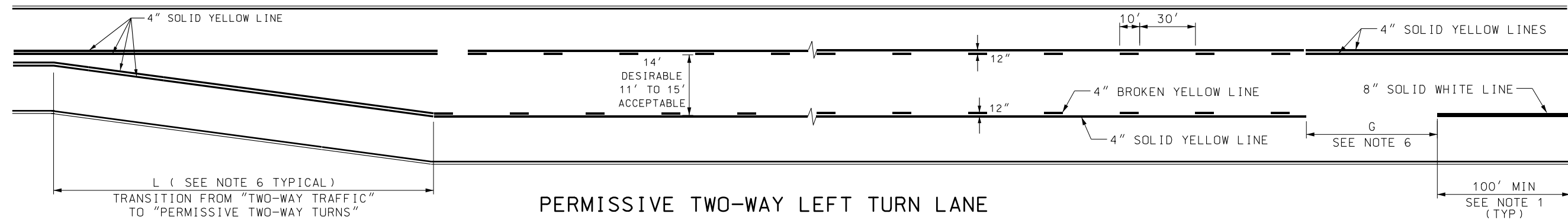
RECOMMENDED FOR APPROVAL _____ SAINT LOUIS COUNTY MO
CHAIRMAN STANLEY COMMITTEE _____
APPROVED _____
DATE JAN 01, 2005
DATE JAN 01, 2005

OBJECT MARKERS "T" INTERSECTION AND PAVEMENT TRANSITION GUIDANCE

STANDARD DRAWING TITLE

STD DWG
ST 1

Doc
Page
250



- NOTES:

1. USE A CAPACITY ANALYSIS TO DETERMINE THE LENGTH OF STORAGE REQUIRED FOR TURN LANE. A MINIMUM LENGTH OF 100 FEET IS REQUIRED.
2. USE THE STANDARD HIGHWAY SIGNS MANUAL FOR PAVEMENT MESSAGES.
3. USE PAVEMENT MARKINGS CONSISTING OF 2 TURN ARROWS, AND TWO R3-7R OR R3-7L SIGNS WHEN A THROUGH LANE CHANGES TO A MANDATORY RIGHT OR LEFT TURN.
4. PAVEMENT MARKING ARROWS ARE OPTIONAL FOR RIGHT OR LEFT TURN LANES AND FOR TWO-WAY LEFT TURN LANES.
5. CREATE A PAVEMENT MARKING ISLAND BY PLACING TWO DOUBLE YELLOW LINES FOR EACH DIRECTION (4 SOLID YELLOW LINES TOTAL).
6. G = 90' FOR SPEEDS 40 MPH AND BELOW
G = 140' FOR SPEEDS 45 TO 50 MPH
G = 180' FOR SPEEDS 55 MPH AND ABOVE
7. FOR RAISED ISLAND AND PLOWABLE END SECTION DETAILS REFER TO STD DWGS GW 1A AND GW 1B.
8. FOR TAPER LENGTH "L" REFER TO TABLE I ON STD DWG DD3.

PAINTED MEDIAN AND AUXILIARY LANE DETAILS	STANDARD DRAWING TITLE STD DWG ST 5	UTAH DEPARTMENT OF TRANSPORTATION STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION SAINT LARK, UTAH		REVISIONS 1 02/24/05 B.A. NOTE REFERENCE CORRECTED IN UPPER LEFT DETAIL. 2 02/23/06 B.A. CORRECTED TYPO IN NOTE 6.	
		RECOMMENDED FOR APPROVAL _____ DATE FEB.23.2006			
		CHAIRMAN STANDARDS COMMITTEE APPROVED _____ DATE FEB.23.2006			
		DEPUTY DIRECTOR _____ DATE FEB.23.2006			
		NO. _____ DATE _____ APPR. _____ REMARKS _____			

Standards Committee Submittal Sheet

Name of preparer: Richard Hibbard
Title/Position of preparer: Signal and Lighting Engineer
Specification/Drawing/Item Title: Traffic Loop Detector Details
Specification/Drawing Number: SL 11

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

SL 11 – Drawing updated to show modern loop technology and current installation procedure.

- **The existing standard is outdated and unreliable. Preformed loops require thinner cuts and therefore cause less damage to asphalt than PVC loops.**
- **Preformed loops have proven more reliable than wire loops when placed in asphalt, however wire loops will be maintained as an option for concrete paving.**

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No change to measurement and payment.

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

Drawing sent out 9/14/07. No comments received.

ACEC Comments: (Use as much space as necessary.)

Drawing sent out 9/14/07. No comments received.

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

See attached distribution list.

Construction Engineers

See attached distribution list.

Contractors (Any additional contacts beyond "C" above.)

See attached distribution list.

Suppliers

These changes have no significant effect on suppliers. We have a procurement contract in place to purchase preformed loops. These items are available from local suppliers.

Consultants (as required) (Any additional contacts beyond "C" above.)

See attached distribution list.

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Drawing sent on 9/14/07. No comments received.

Others (as appropriate)

None

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

No changes to minimum sampling and testing.

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

No changes to business systems.

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Will be included in publication of next (2008) changes to standards.

- F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

Wire loops were a typical \$600 - \$800 per loop whereas preformed loops will cost approximately \$1,200 per loop installed. There is no significant cost difference between PVC loops and preformed loops.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

Maintenance costs will be reduced due to improved life and performance of the preformed loop versus wire loops. Additionally, preformed loops generally do not require asphalt trenching as do PVC loops while still having a similar life cycle.

3. Life cycle cost.

Life cycle costs will be reduced significantly since preformed loops generally last much longer than wire loops.

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

This update will improve signal detection system performance and reliability.

- H. Safety Impacts?

Improved reliability will provide consistent signal controller response and intersections that function as designed.

- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

We have been successfully installing preformed loops in areas of asphalt roadway as replacements for wire loops or other failed detection. Trenched in PVC loops have resulted in significant asphalt degradation at intersection detection areas.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

Subject: Changes to SL11, Traffic Signal Loop Detector
Created By: RHIBBARD@utah.gov
Scheduled Date:
Creation Date: 9/14/2007 3:10 PM
From: Richard Hibbard

Recipient	Action	Date & Time	Comment
To: Betty Purdie (BPURDIE)	Read	9/14/2007 5:15 PM	
To: Dennis Simper (DENNISSIMPER)	Read	9/17/2007 6:56 AM	
To: Hugh Kirkham (HKIRKHAM)	Read	9/16/2007 10:54 PM	
To: Jim McConnell (JMCCONNELL)	Read	9/17/2007 10:17 AM	
To: Kevin Griffin (KGRIFFIN)	Read	9/15/2007 6:40 PM	
To: Rob Wight (RWIGHT)	Read	9/17/2007 11:28 AM	
To: Robert Dowell (RDOWELL)	Read	9/29/2007 9:07 AM	
To: Robert Westover (RWESTOVER)	Delivered	9/14/2007 3:11 PM	
To: Scott Andrus (SCOTTANDRUS)	Read	9/24/2007 4:57 PM	

Subject: Revision - UDOT Standard Drawing SL 11 - Loop Detection
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Creation Date: 9/14/2007 3:13 PM
From: Richard Hibbard

Recipient	Action	Date & Time	Comment
To: adaleiden@kittelson.com (adaleiden)	Transferred	9/14/2007 3:14 PM	
To: andrew.gemperline@c-b.com (andrew.gemperline)	Transferred	9/14/2007 3:14 PM	
To: andy_powell@urscorp.com (andy_powell)	Transferred	9/14/2007 3:15 PM	
To: atrans@comcast.net (atrans)	Transferred	9/14/2007 3:14 PM	
To: awall@wcecemgomeers.com (awall)	Transfer Failed	9/14/2007 3:15 PM	
To: bbanks@wilbursmith.com (bbanks)	Transferred	9/14/2007 3:15 PM	
To: bill.gooch@crsengineers.com (bill.gooch)	Transferred	9/14/2007 3:14 PM	
To: bpeterson@m-m.net (bpeterson)	Transferred	9/14/2007 3:15 PM	
To: brent.jensen@hdrinc.comm (brent.jensen)	Transfer Failed	9/14/2007 3:15 PM	
To: christensen@pbworld.com (christensen)	Transferred	9/14/2007 3:15 PM	
To: david@thompsontransportationinc.com (david)	Transferred	9/14/2007 3:15 PM	
To: deitel@kirkham.com (deitel)	Transferred	9/14/2007 3:14 PM	
To: dforbes@hntb.com (dforbes)	Transferred	9/14/2007 3:14 PM	
To: gary@pecutah.com (gary)	Transferred	9/14/2007 3:15 PM	
To: gdeneris@forsgren.com (gdeneris)	Transferred	9/14/2007 3:14 PM	

To: j.nepstad@fehrandpeers.com (j.nepstad)	Transferred	9/14/2007 3:14 PM
To: jay.nelson@dmjmharris.com (jay.nelson)	Transferred	9/14/2007 3:14 PM
To: john.grant@transcore.com (john.grant)	Transferred	9/14/2007 3:15 PM
To: kcomer@civilsience.com (kcomer)	Transferred	9/14/2007 3:14 PM
To: kwilson@sunrise-eng.com (kwilson)	Transferred	9/14/2007 3:15 PM
To: mac.mcomber@wgint.com (mac.mcomber)	Transferred	9/14/2007 3:15 PM
To: martinglaubit@zmail.com (martinglaubit)	Transferred	9/14/2007 3:14 PM
To: matthew.wildauer@parsons.com (matthew.wildauer)	Transferred	9/14/2007 3:14 PM
To: michael.falini@wilsonco.com (michael.falini)	Transferred	9/14/2007 3:15 PM
To: mworrall@jub.com (mworrall)	Transferred	9/14/2007 3:14 PM
To: pierre.pretorius@kimley-horn.com (pierre.pretorius)	Transferred	9/14/2007 3:14 PM
To: ronm@horrocks.com (ronm)	Transferred	9/14/2007 3:14 PM
To: shendricks@rbgengineering.com (shendricks)	Transferred	9/14/2007 3:15 PM
To: sjohnson@merid-eng.com (sjohnson)	Transferred	9/14/2007 3:14 PM
To: todd@tperk.com (todd)	Transferred	9/14/2007 3:15 PM
To: trent.thatcher@stantec.com (trent.thatcher)	Transferred	9/14/2007 3:15 PM
To: trobirds@hwlochner.com (trobirds)	Transferred	9/14/2007 3:14 PM

Subject: Revision - UDOT Standard Drawing SL 11 - Traffic Loops
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Creation Date: 9/14/2007 3:16 PM
From: Richard Hibbard

Recipient	Action	Date & Time	Comment
To: anthony.sarhan@dot.gov (anthony.sarhan)	Transferred	9/14/2007 3:17 PM	
To: mont.wilson@gcinc.com; tyorgason@civilsience.com (mont.wilson)	Transferred	9/14/2007 3:16 PM	

Subject: Revision - UDOT Standard Drawing SL 11 - Traffic Loops
Created By: RHIBBARD@utah.gov
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Creation Date: 9/14/2007 3:22 PM
From: Richard Hibbard

Recipient	Action	Date & Time	Comment
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To: Darin Duersch (DDUERSCH)	Delivered	9/14/2007 3:22 PM	
To: Doug Bassett (DBASSETT)	Read	9/24/2007 8:33 AM	

To: ericw@cve.com (ericw)	Transferred	9/14/2007 3:22 PM
To: Graig Ogden (GOGDEN)	Delivered	9/14/2007 3:22 PM
To: Grant Jackson (GRANTJACKSON)	Read	9/21/2007 11:30 AM
To: Guy Buckner (GBUCKNER)	Read	9/26/2007 1:20 PM
To: Mark Taylor (MARKTAYLOR)	Read	9/19/2007 8:02 AM
To: Oanh Le (OANHLE)	Read	9/17/2007 7:58 AM
To: Sean Nelson (sean.nelson)	Transferred	9/14/2007 3:22 PM
To: tnoall@gadesttraffic.com (tnoall)	Transferred	9/14/2007 3:22 PM
To: Tony Altenes (tony.altenes)	Transferred	9/14/2007 3:22 PM
To: Troy Torgersen (TTORGERSEN)	Read	9/17/2007 8:28 AM
To: William Butterfield (WBUTTERFIELD)	Read	9/16/2007 3:59 PM

Std Dwg/Spec Number	SL 11	Sheet 1	of	1
Date:	10/02/07	Facilitator:	Richard Hibbard	

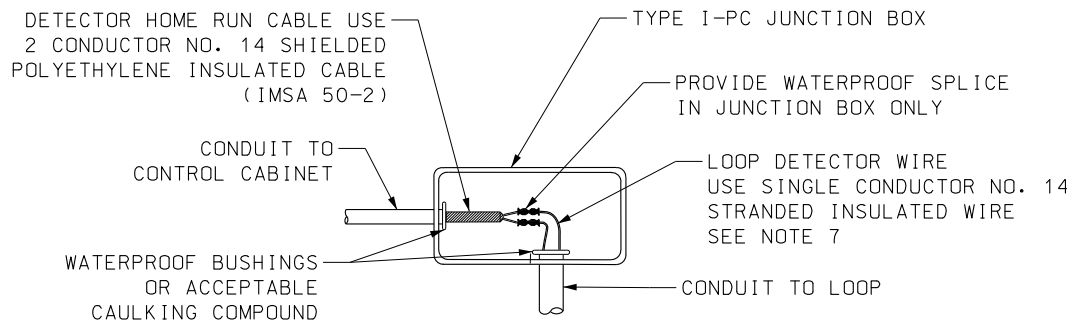
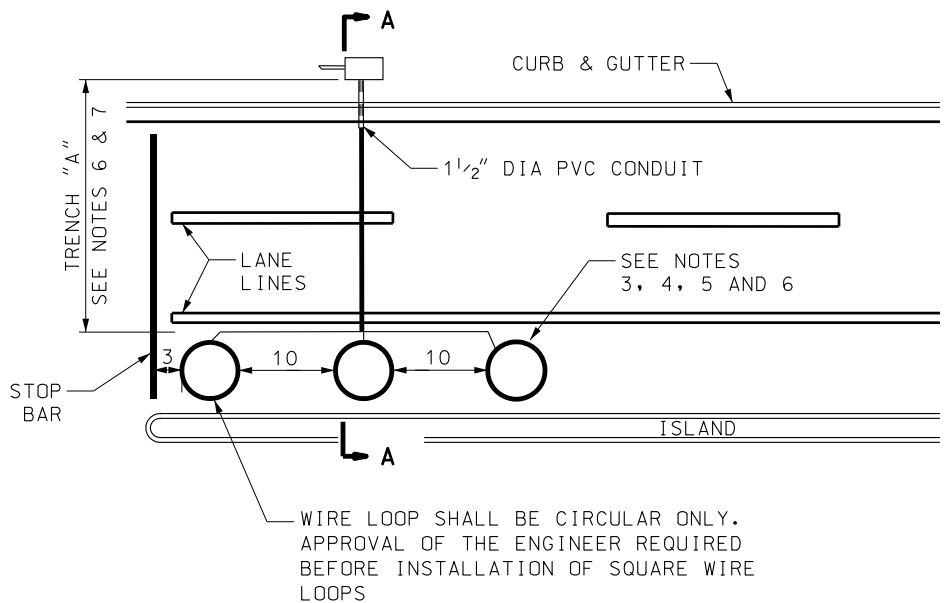
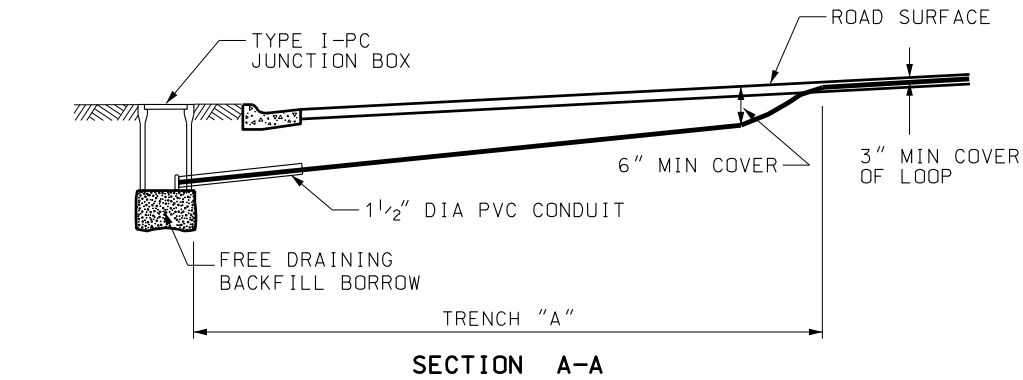
Review Comments Form

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
1	Grant Jackson	SL 11	Why are we eliminating PVC loops? Response: Preformed loops act in the same capacity as PVC loops, yet require less effort to install and cause less damage to the driving surface. Preformed loops can be placed in UTBC like PVC loops.		
2					
			Response:		
3					
			Response:		
4					
			Response:		
5					
			Response:		
6					
			Response:		
7					
			Response:		
8					
			Response:		
9					
			Response:		
10					
			Response:		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

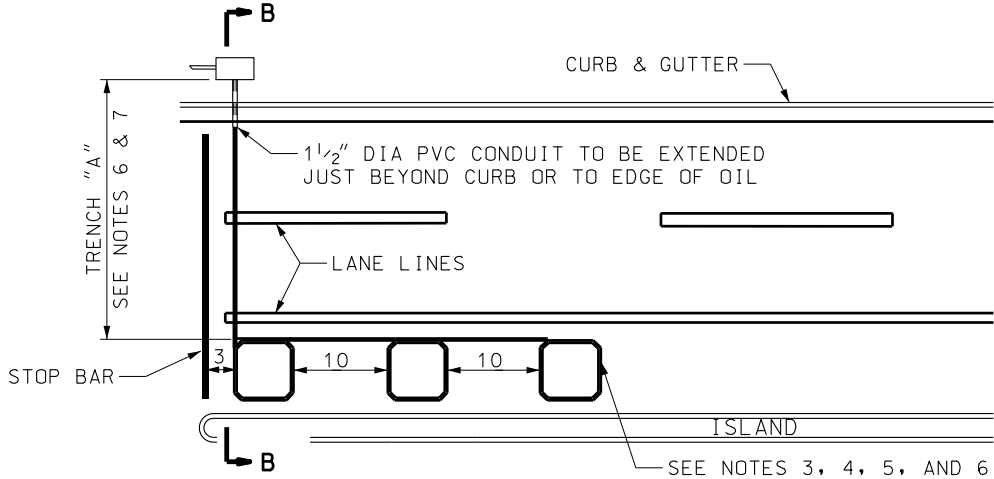
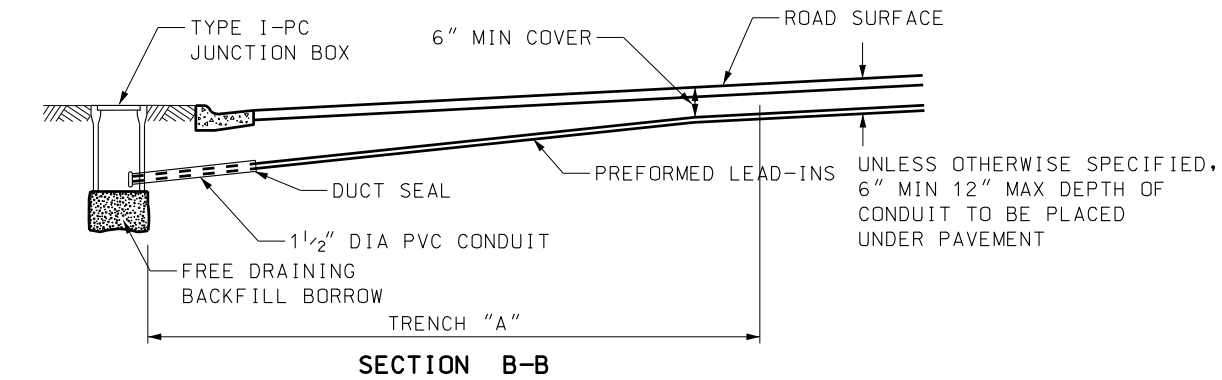
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PREFORMED LOOP OR WIRE LOOP DETAIL
(CONCRETE ONLY)



LEAD-IN/HOME RUN SPLICE DETAIL

PREFORMED LOOP DETAIL
(ASPHALT OR UNDER NEW CONCRETE)



NOTES:

1. BACKFILL TRENCH WITHIN 8 HOURS OF TRENCHING WITH SPECIFIED MATERIALS.
2. USE SCHEDULE 40 PVC CONDUIT.
3. SAW CUT 1/2" MAXIMUM WIDTH. INSTALL ALL CONDUCTORS IN SAW CUT. PLACE CABLE OR WIRE AT BOTTOM OF DRY SLOT. USE EPOXY SEAL WHICH DOES NOT CONTAIN ACETONE SOLVENT TO CLOSE SAW CUT. DO NOT USE WIRE LOOPS IN ASPHALT OR UNDER NEW CONCRETE.
4. USE 4 TURNS OF SINGLE CONDUCTOR #14 AWG CABLE ON ALL LOOPS 6' X 12' AND SMALLER. DO NOT TWIST WIRES IN LOOP.
5. SEE PLAN SHEETS FOR DETECTOR LOOP LOCATION. IF A DETECTOR LOOP LOCATION IS IN CONFLICT WITH A MANHOLE, WATER VALVE, OR PAVEMENT EXPANSION JOINT, ADJUST THE LOOP PLACEMENT FORWARD OR BACKWARD IN THE SHORTEST DIRECTION FROM THE OPTIMUM POSITION.
6. DO NOT SPLICE THE TRAFFIC SIGNAL FIELD WIRE EXCEPT THE JUNCTION BOX LOOP WIRE CONNECTIONS. TAG AND NUMBER EACH LOOP WIRE IN CONFORMANCE WITH THE DESIGN. PLACE LOOP DETECTOR WIRE COUNTER CLOCKWISE.
7. TWIST WIRES BETWEEN LOOP AND JUNCTION BOX (TRENCH "A"). USE AT LEAST ONE TWIST PER FOOT IN SAW CUTS AND AT LEAST THREE TWISTS PER FOOT IN CONDUIT. FOR SAW-CUT LOOP INSTALLATIONS, USE SINGLE CONDUCTOR NO. 14 STRANDED TYPE XLPE OR XHHW WIRE (IMSA 51-7). FOR PVC CONDUIT INSTALLATIONS, USE SINGLE CONDUCTOR NO. 14, STRANDED TYPE XHHW WIRE (IMSA 51-3).
8. INSPECT AND TEST ALL LOOPS.
9. DO NOT HOOK UP MORE THAN 4 LOOPS TO THE SAME HOMERUN CABLE OR AMPLIFIER CHANNEL.

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

TRAFFIC SIGNAL
LOOP DETECTOR
DETAILS

STD DWG
SL 11

STANDARD DRAWING TITLE

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REVISIONS

1 02/23/06 L.M. ENTIRE DRAWING REVISED.

2 9/14/07 L.M. ENTIRE DRAWING MODIFIED.

REMARKS

NO. DATE APPR.

DATE

DATE

DEPUTY DIRECTOR

STANDARD DRAWING TITLE

Standards Committee Submittal Sheet

Name of preparer: Richard Hibbard
Title/Position of preparer: Signal and Lighting Engineer
Specification/Drawing/Item Title: Single Transformer Substation Details
Specification/Drawing Number: SL 18

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

SL 18 – Drawing updated to show modern transformer and lighting service pedestal.

- **The existing standard is outdated and unreliable. The combined transformer/control cabinet is prone to rust.**
- **The proposed lighting control pedestal is less obtrusive, contains adequate space for lighting control circuit breaker panel, contactors, and digital time clock if specified.**
- **Omitted Note 4 because specifications regarding the lighting pedestal are defined in Standard Specification 16525 Highway Lighting.**

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No change to measurement and payment.

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)
No comments received.

ACEC Comments: (Use as much space as necessary.)
No comments received.

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

See attached distribution list.

Construction Engineers

See attached distribution list.

Contractors (Any additional contacts beyond "C" above.)

See attached distribution list.

Suppliers

These changes have no significant effect on suppliers. We have a procurement contract in place to purchase both the transformers and lighting service pedestals. These items are available from local suppliers.

Consultants (as required) (Any additional contacts beyond "C" above.)

Contacted ACEC only.

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

No comments received.

Others (as appropriate)

None

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

No changes to measurement and changes.

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

No changes to business systems.

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Will be included in publication of next (2008) changes to standards.

- F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

No significant change to bid item prices.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

Maintenance costs will be reduced due to improved lighting control pedestal.

3. Life cycle cost.

Life cycle costs will be reduced slightly due to reduced maintenance costs.

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

This update will improve lighting system performance and reliability.

- H. Safety Impacts?

Improved reliability will provide consistent lighting system that works as designed.

- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

We have been successfully specified lighting control pedestals with breaker panels on lighting projects as a special provision.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

Subject: Std Dwg SL 18
 Created By: WSTARKENBURG@utah.gov
 Scheduled Date:
 Creation Date: 9/20/2007 10:10 AM
 From: Wes Starkenburg

*Richard,
 The 125th
 of people
 SL is sent to
 Wes*

Recipient	Action	Date & Time	Comment
To: A J Rogers (AJROGERS)	Delivered	9/20/2007 10:11 AM	
To: Anthony Sarhan (anthony.sarhan)	Pending		
CC: Barry Axelrod (BAXELROD)	Delivered	9/20/2007 10:11 AM	
To: Betty Purdie (BPURDIE)	Delivered	9/20/2007 10:10 AM	
To: Bill Lawrence (BILLLAWRENCE)	Delivered	9/20/2007 10:10 AM	
To: Bill Smith (BILLSMITH)	Delivered	9/20/2007 10:10 AM	
To: Boyd Wheeler (BWHEELER)	Delivered	9/20/2007 10:11 AM	
To: Brent Christensen (BCHRISTENSEN)	Pending		
To: Brent Schvaneveldt (BSCHVANEVELDT)	Delivered	9/20/2007 10:10 AM	
To: Bret Sorenson (BSORENSEN)	Delivered	9/20/2007 10:11 AM	
To: Clark Mackay (CLARKMACKAY)	Delivered	9/20/2007 10:11 AM	
To: Dave Babcock (DBABCOCK)	Delivered	9/20/2007 10:11 AM	
To: Dennis Simper (DENNISIMPER)	Delivered	9/20/2007 10:10 AM	
To: Erik Brondum (EBRONDUM)	Pending		
To: Ervan Rhoades (ERHOADES)	Delivered	9/20/2007 10:10 AM	
To: Jack Mason (JMMASON)	Delivered	9/20/2007 10:10 AM	
To: Kevin Griffin (KGRIFFIN)	Delivered	9/20/2007 10:10 AM	
To: Kevon Ogden (KEVONOGDEN)	Delivered	9/20/2007 10:10 AM	
CC: Kris Peterson (KRISPETERSON)	Delivered	9/20/2007 10:11 AM	
To: Layne Slack (LSLACK)	Delivered	9/20/2007 10:11 AM	
To: Les Henrie (LHENRIE)	Delivered	9/20/2007 10:11 AM	
CC: Lynn Bernhard (LYNNBERNHARD)	Delivered	9/20/2007 10:11 AM	
To: Mike Miles (MMILES)	Delivered	9/20/2007 10:11 AM	
To: Mont Wilson (mont.wilson)	Pending		
To: Nathan Merrill (NMERRILL)	Delivered	9/20/2007 10:11 AM	
To: Nathan Peterson (NATEPETERSON)	Delivered	9/20/2007 10:10 AM	
To: Norton Thurgood (NTHURGOOD)	Delivered	9/20/2007 10:10 AM	
To: Patrick McGann (PMCGANN)	Delivered	9/20/2007 10:11 AM	
CC: Peter Negus (PNEGUS)	Delivered	9/20/2007 10:11 AM	
To: Randy Park (RPARK)	Delivered	9/20/2007 10:10 AM	
To: Ree Schena (RSCHENA)	Delivered	9/20/2007 10:11 AM	
To: Rex Harris (REXHARRIS)	Delivered	9/20/2007 10:10 AM	
To: Richard Clarke (RICHARDCLARKE)	Delivered	9/20/2007 10:11 AM	
CC: Richard Hibbard (RHIBBARD)	Delivered	9/20/2007 10:11 AM	
To: Rick Debban (RDEBBAN)	Delivered	9/20/2007 10:10 AM	
To: Rob Wight (RWIGHT)	Delivered	9/20/2007 10:10 AM	
To: Robert Hull (RHULL)	Delivered	9/20/2007 10:11 AM	
CC: Robert Miles (ROBERTMILES)	Delivered	9/20/2007 10:11 AM	
To: Robert Nebeker (RNEBEKER)	Delivered	9/20/2007 10:11 AM	
To: Robert Westover (RWESTOVER)	Delivered	9/20/2007 10:10 AM	
To: Rukhsana Lindsey (RLINDSEY)	Delivered	9/20/2007 10:11 AM	
To: Scott Andrus (SCOTTANDRUS)	Delivered	9/20/2007 10:10 AM	
To: Scott Nussbaum (SNUSSBAUM)	Delivered	9/20/2007 10:10 AM	
CC: Stan Adams (STANADAMS)	Delivered	9/20/2007 10:11 AM	
To: Stan Burns (SBURNS)	Delivered	9/20/2007 10:11 AM	
To: Steve Ogden (SOGDEN)	Delivered	9/20/2007 10:11 AM	
To: Steven Acerson (SACERSON)	Delivered	9/20/2007 10:10 AM	
To: Tim Biel (TBIEL)	Delivered	9/20/2007 10:11 AM	
To: Todd Richins (TLRICHINS)	Delivered	9/20/2007 10:10 AM	
To: Tyler Yorgason (tyorgason)	Pending		
To: Val Stoker (VSTOKER)	Delivered	9/20/2007 10:10 AM	
BC: Wes Starkenburg (WSTARKENBURG)	Read	9/20/2007 10:11 AM	

Standard Drawing/Specification Review Sheet

Review Comments

Std Dwg/Spec Number	SL 18	Sheet 1	of	1
Date:	10/04/07	Facilitator:	Richard Hibbard	

Review Comments Form

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
1	Clark Mackay, EM II, Richfield	SL 18	Editorial adjustments (Misspellings). Changes made.		

2	Clark Mackay	SL 18	On lower right detail, the concrete and granular sections appear out of proportion between the transformer and pedestal. What is the thickness of granular under the pedestal? Response: Adjustments made so that sections appear proportionately with regard to thickness. Granular thickness added.		
---	--------------	-------	--	--	--

3	Clark Mackay	SL 18	Must the base under the pedestal be cast-in-place concrete or may it be precast like the transformer? Response: The pedestal base must be cast in place concrete. This detail is a reflection of our SL 3 Underground Service Pedestal standard drawing.		
---	--------------	-------	---	--	--

4	Mike Miles, R-4 Pre-construction	SL 18	No comment. Response:		
---	----------------------------------	-------	--------------------------	--	--

5	Tim Biel, UDOT Materials	SL 18	Change "drainage" to "draining". Response: Change made.		
---	--------------------------	-------	--	--	--

6	Patrick McGann, R-4 Roadway Operations	SL 18	No comment Response:		
---	--	-------	-------------------------	--	--

7	Brent Schvaneveldt, EM II, R-3	SL 18	No comment Response:		
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8					
			Response:		

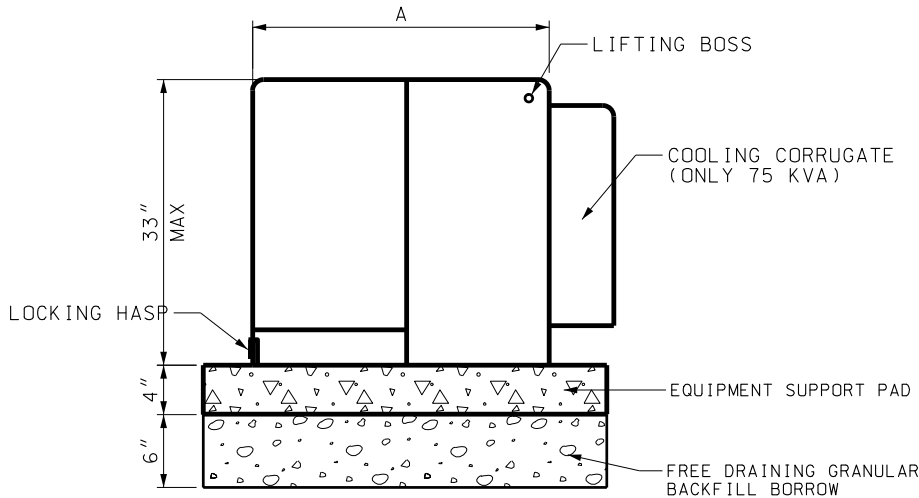
9					
			Response:		

10					
			Response:		

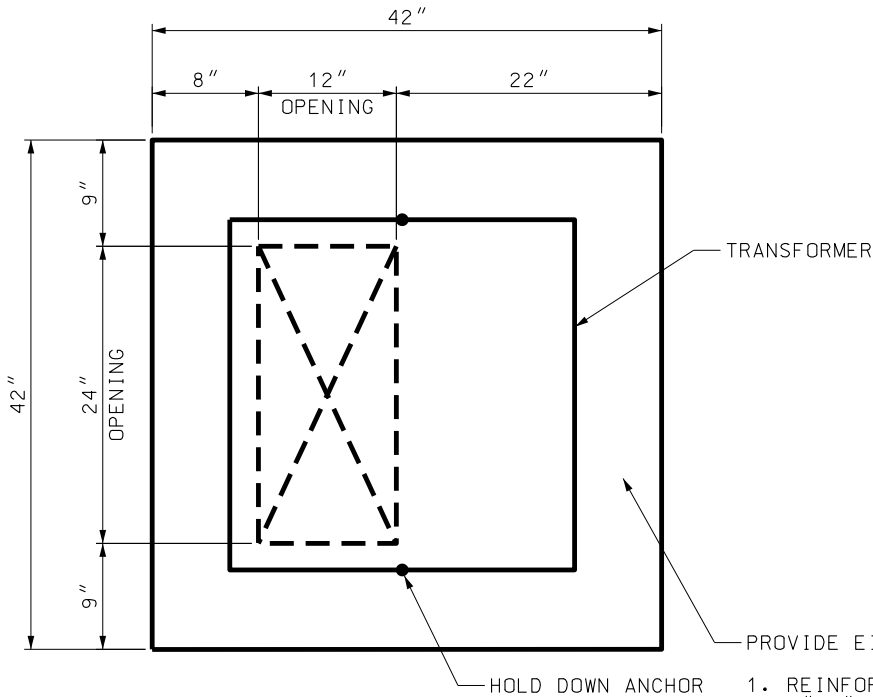
Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

TRANSFORMER DIMENSION		
ITEM	A	B
25KVA	29"	33"
50KVA	31"	33"
75KVA	32.5"	33"

CONFIRM ACTUAL TRANSFORMER DIMENSIONS. IF THEY EXCEED THOSE LISTED. SIZE THE EQUIPMENT SUPPORT PAD ACCORDINGLY.

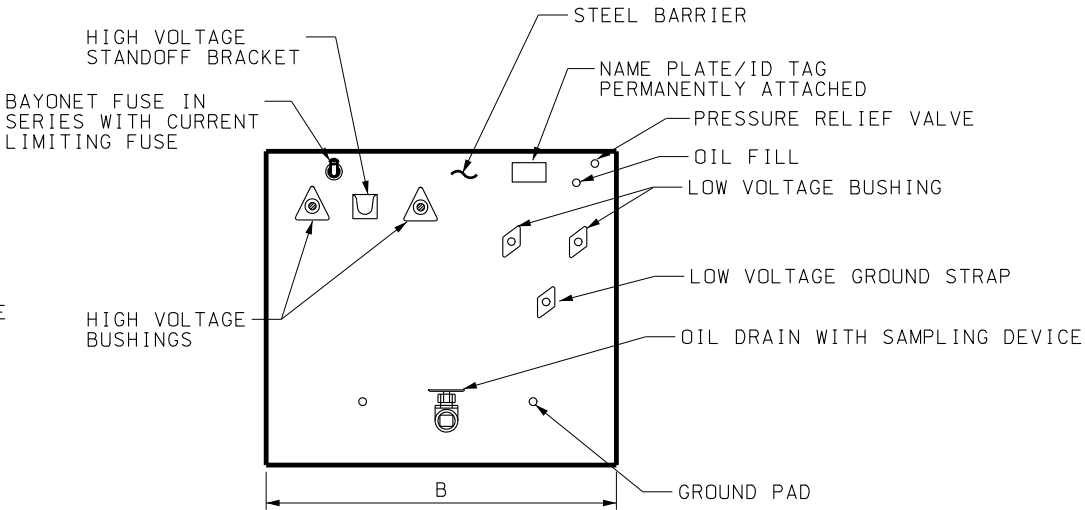


TRANSFORMER SIDE ELEVATION

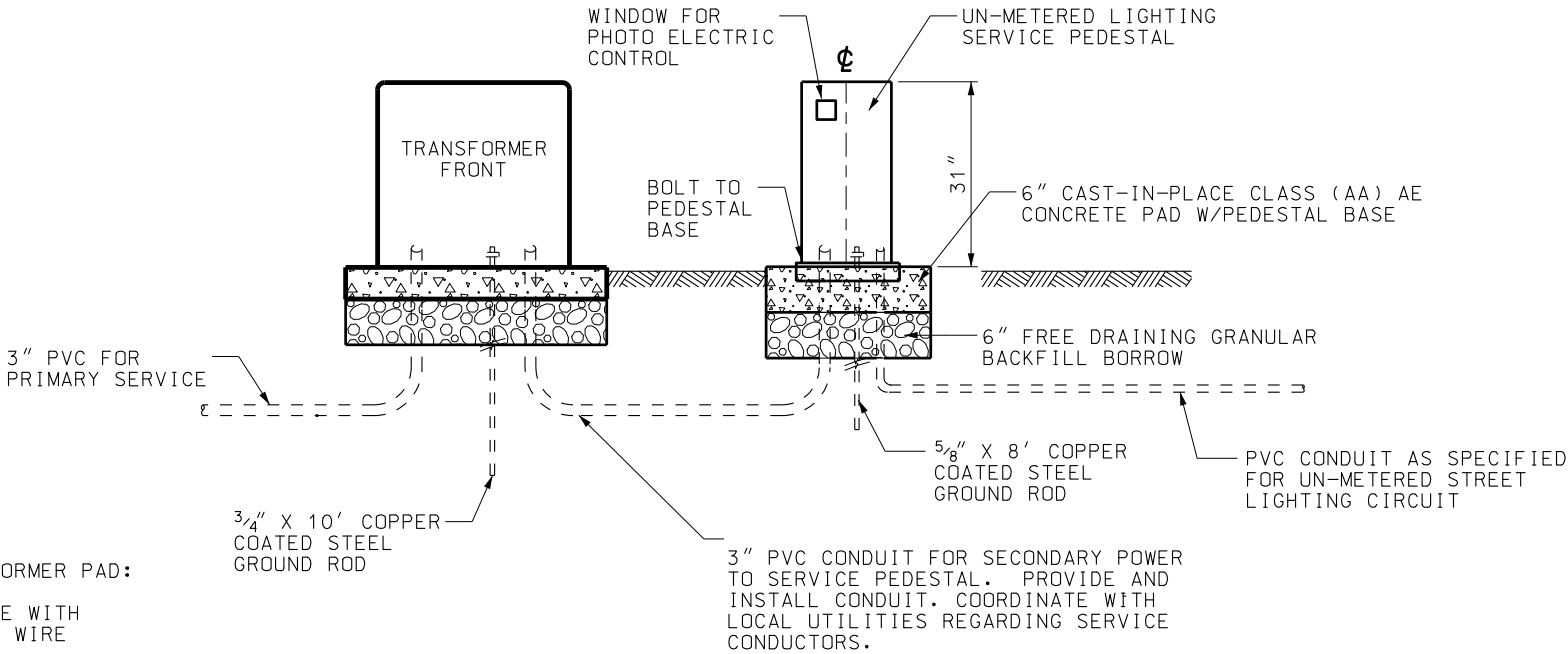


EQUIPMENT SUPPORT PAD PLAN

1. REINFORCED CONCRETE WITH 6"x6"x10/10 WELDED WIRE FABRIC. 2" COVER. CAST-IN-PLACE OR PRECAST.
2. PREFABRICATED POLYMER CONCRETE.



TRANSFORMER FRONT DOOR OPEN ELEVATION



NOTES:

1. POWER COMPANY SERVICE POINT. SINGLE PHASE VOLTAGE WITH DISCONNECTING PROVISIONS. POWER COMPANY TO RUN UNDER GROUND CABLE CONNECTION IN CONTRACTOR FURNISHED TRENCH TO TRANSFORMER HIGH VOLTAGE TERMINALS.
 - A. CONTRACTOR CONTACTS SERVING POWER COMPANY TO VERIFY PRIMARY VOLTAGE AND TYPE OF CONNECTION.
 - B. CONTRACTOR NOTIFIES SERVING POWER COMPANY A MINIMUM OF 24 HOURS IN ADVANCE OF DESIRED POWER SOURCE CONNECTION.
2. LOCATE SERVICE PEDESTAL ON EITHER SIDE OF CONTROLLER FOUNDATION AS SPECIFIED. LOCATION MAY BE MODIFIED TO BEST SUIT FIELD CONDITIONS PER RESIDENT ENGINEER APPROVAL. MAINTAIN 48 INCH MINIMUM CLEARANCE AROUND EACH UNIT WITH DOORS OPENED TO ANY POSITION.
3. LOCATE SERVICE PEDESTAL AND TRANSFORMER SO WATER DRAINS AWAY FROM FOUNDATIONS AND JUNCTION BOXES. SITE PREPARATION INCLUDING GRADING MAY BE REQUIRED BEFORE PLACING EQUIPMENT.

SINGLE TRANSFORMER SUBSTATION DETAILS		UTAH DEPARTMENT OF TRANSPORTATION STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION SALT LAKE CITY, UTAH		REVISIONS	
STANDARD DRAWING TITLE		RECOMMENDED FOR APPROVAL		ENTIRE DRAWING MODIFIED. TITLE CHANGED.	
		CHAIRMAN STANDARDS COMMITTEE		PREVIOUSLY SL 16	
		DEPUTY DIRECTOR		ENTIRE DRAWING MODIFIED.	
		DATE		DATE	
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Standards Committee Submittal Sheet

Name of preparer: Richard Hibbard
Title/Position of preparer: Signal and Lighting Engineer
Specification/Drawing/Item Title: Highway Lighting
Specification/Drawing Number: 16525

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

16525 – Specification revised and updated to current industry and regulatory standards for steel, transformers, lighting service pedestals, ballasts, and lamps. Also omitted items no longer used such as mercury lamps and added new technology such as induction lamps.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No change to measurement and payment.

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)
No comments received.

ACEC Comments: (Use as much space as necessary.)
Refer to Review Comments Form.

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

See attached distribution list and Review Comments Form.

Construction Engineers

See attached distribution list. No comments received.

Contractors (Any additional contacts beyond "C" above.)

See attached distribution list. No comments received.

Suppliers

See attached distribution list and Review Comments Form.

Consultants (as required) (Any additional contacts beyond "C" above.)

See attached distribution list. Received comments from ACEC rep.

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

No comments received. Provided follow up phone call to verify.

Others (as appropriate)

None

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

No changes to measurement and changes.

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

No changes to business systems.

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Will be included in publication of next (2008) changes to standards.

- F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

No significant change to bid item prices.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

Maintenance costs will be reduced when induction lighting, which has a projected life of 100,000 hours, is appropriately specified. We will have more options with regard to high mast lighting.

3. Life cycle cost.

Life cycle costs will be reduced slightly when induction lighting can be applied.

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

This update will bring our specification in line with industry and regulatory standards.

H. Safety Impacts?

Specification brought in line with current AASHTO requirements for steel.

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

The main issue is that this standard specification is outdated. Our current procurement contracts have addressed this issue so our state furnished materials currently meet this new specification.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

Subject: 16525 Highway Lighting spec revised for 2008
Created By: RHIBBARD@utah.gov
Scheduled Date:
Creation Date: 8/31/2007 2:20 PM
From: Richard Hibbard

Recipient	Action	Date & Time	Comment
To: bsladek@valmont.com (bsladek)	Transferred	8/31/2007 2:21 PM	
To: bvanwagenen@clservices.com (bvanwagenen)	Transferred	8/31/2007 2:21 PM	
To: clark@ssco.net (clark)	Transferred	8/31/2007 2:21 PM	
To: danny.ameron@gmail.com (danny.ameron)	Transferred	8/31/2007 2:21 PM	
To: ericw@cve.com (ericw)	Transferred	8/31/2007 2:21 PM	
To: jcoleman@gadestraffic.com (jcoleman)	Transferred	8/31/2007 2:21 PM	
To: mduffy@unionmetal.com (mduffy)	Transferred	8/31/2007 2:21 PM	
To: pplasha@mountainstateslighting.com (pplasha)	Transferred	8/31/2007 2:21 PM	
To: RWeight@holophane.com (RWeight)	Transferred	8/31/2007 2:21 PM	
To: Sean Nelson (sean.nelson)	Transferred	8/31/2007 2:21 PM	
To: tnoall@gadestraffic.com (tnoall)	Transferred	8/31/2007 2:21 PM	
To: Tony Altenes (tony.altenes)	Transferred	8/31/2007 2:21 PM	
To: William Butterfield (WBUTTERFIELD)	Delivered	8/31/2007 2:20 PM	

Subject: 16525 Highway Lighting specification revision 2008
Created By: RHIBBARD@utah.gov
Scheduled Date:
Creation Date: 8/31/2007 2:28 PM
From: Richard Hibbard

Recipient	Action	Date & Time	Comment
To: anthony.sarhan@dot.gov (anthony.sarhan)	Transferred	8/31/2007 2:29 PM	
To: mont.wilson@gcinc.com (mont.wilson)	Transferred	8/31/2007 2:29 PM	
To: tyorgason@civilsience.com (tyorgason)	Transferred	8/31/2007 2:29 PM	

Subject: 16525 Highway Lighting spec revision for 2008
Created By: RHIBBARD@utah.gov
Scheduled Date:
Creation Date: 8/31/2007 2:35 PM
From: Richard Hibbard

Recipient	Action	Date & Time	Comment
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To: adaleiden@kittelton.com (adaleiden)	Transferred	8/31/2007 2:35 PM
To: andrew.gemperline@c-b.com (andrew.gemperline)	Transferred	8/31/2007 2:36 PM
To: andy_powell@urscorp.com (andy_powell)	Transferred	8/31/2007 2:35 PM
To: atrans@comcast.net (atrans)	Transferred	8/31/2007 2:35 PM
To: awall@wcecemgomeers.com (awall)	Transfer Failed	8/31/2007 2:36 PM
To: bbanks@wilbursmith.com (bbanks)	Transferred	8/31/2007 2:35 PM
To: bill.gooch@crsengineers.com (bill.gooch)	Transferred	8/31/2007 2:35 PM
To: bpeterson@m-m.net (bpeterson)	Transferred	8/31/2007 2:35 PM
To: brent.jensen@hdrinc.com (brent.jensen)	Transfer Failed	8/31/2007 2:36 PM
To: christensen@pbworld.com (christensen)	Transferred	8/31/2007 2:35 PM
To: david@thompsontransportationinc.com (david)	Transferred	8/31/2007 2:35 PM
To: deitel@kirkham.com (deitel)	Transferred	8/31/2007 2:35 PM
To: dforbes@hntb.com (dforbes)	Transferred	8/31/2007 2:35 PM
To: gary@pecutah.com (gary)	Transferred	8/31/2007 2:35 PM
To: gdeneris@forsgren.com (gdeneris)	Transferred	8/31/2007 2:35 PM
To: j.nepstad@fehrandpeers.com (j.nepstad)	Transferred	8/31/2007 2:35 PM
To: jay.nelson@dmjmharris.com (jay.nelson)	Transferred	8/31/2007 2:35 PM
To: john.grant@transcore.com (john.grant)	Transferred	8/31/2007 2:35 PM
To: kcomer@civilsience.com (kcomer)	Transferred	8/31/2007 2:35 PM
To: kwilson@sunrise-eng.com (kwilson)	Transferred	8/31/2007 2:35 PM
To: mac.mcomber@wgint.com (mac.mcomber)	Transferred	8/31/2007 2:35 PM
To: martinglaubit@zmail.com (martinglaubit)	Transferred	8/31/2007 2:35 PM
To: matthew.wildauer@parsons.com (matthew.wildauer)	Transferred	8/31/2007 2:35 PM
To: michael.falini@wilsonco.com (michael.falini)	Transferred	8/31/2007 2:35 PM
To: mworrall@jub.com (mworrall)	Transferred	8/31/2007 2:35 PM
To: pierre.pretorius@kimley-horn.com (pierre.pretorius)	Transferred	8/31/2007 2:35 PM
To: ronm@horrocks.com (ronm)	Transferred	8/31/2007 2:35 PM
To: shendricks@rbgengineering.com (shendricks)	Transferred	8/31/2007 2:35 PM
To: sjohnson@merid-eng.com (sjohnson)	Transferred	8/31/2007 2:35 PM
To: todd@tperk.com (todd)	Transferred	8/31/2007 2:35 PM
To: trent.thatcher@stantec.com (trent.thatcher)	Transferred	8/31/2007 2:35 PM
To: trobirds@hwlochner.com (trobirds)	Transferred	8/31/2007 2:35 PM

Subject: 16525 Highway Lighting revision 2008
Created By: RHIBBARD@utah.gov
Scheduled Date:
Creation Date: 8/31/2007 2:37 PM
From: Richard Hibbard

Recipient	Action	Date & Time	Comment
To: Betty Purdie (BPURDIE)	Read	9/4/2007 7:54 AM	
To: Dennis Simper (DENNISSIMPER)	Read	9/4/2007 8:43 AM	
To: Hugh Kirkham (HKIRKHAM)	Read	8/31/2007 3:44 PM	
To: Jim McConnell (JMCCONNELL)	Read	9/4/2007 4:53 PM	
To: Kevin Griffin (KGRIFFIN)	Read	9/4/2007 2:57 PM	
To: Rob Wight (RWIGHT)	Read	9/4/2007 7:15 AM	
To: Robert Dowell (RDOWELL)	Read	8/31/2007 2:47 PM	
To: Robert Westover (RWESTOVER)	Read	9/1/2007 7:10 PM	
To: Scott Andrus (SCOTTANDRUS)	Read	9/3/2007 7:39 AM	

Standard Drawing/Specification Review Sheet

Review Comments

Std Dwg/Spec Number	16525	Sheet 1	of	7
Date:	10/04/07	Facilitator:	Richard Hibbard	

Review Comments Form

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
1	UDOT Structures Dept	1.2	Add Section 02466: Drilled Shaft Addition complete.		
2	UDOT Structures Dept	1.3	Don't need ASTM A 123. AASHTO M 111 covers it. Response: Eliminated ASTM A 123.		
3	UDOT Structures Dept	1.3	Add AASHTO M 232, Zinc Coating (Hot Dip) on Iron and Steel Hardware Response: Added.		
4	UDOT Structures Dept	1.3	ASTM A 570 has been replaced with ASTM A 1011 Stell, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High Strength Low-Allow with Improved Formability, and Ultra-High Strength Response: Per industry response, manufactures do not use A 1011, but rather A 572 and A 595. UDOT Structures was contacted and agree with this change.		
5	UDOT Structures Dept	1.3	Replace ASTM A 576 with ASTM F1554, Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength Response: Change made.		
6	UDOT Structures Dept	1.3.U	Do we need this? Don't we have a standard that would work? Response: Can't find a reason or conflict which would lead us to eliminate this item.		
7	UDOT Structures Dept	1.4.A	Replace "Samples of all materials." With "Supply manufactures certification upon request." Response: Change made.		
8	UDOT Structures Dept	2.6.A	Delete everything after "Use tapered steel poles per SL Series Standard Drawings." Response: Change made.		
9	UDOT Structures Dept	2.6.B	Reference AASHTO M 111 instead of ASTM A 123 Response: Change made.		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet

Review Comments

Std Dwg/Spec Number	16525	Sheet 2	of	7
Date:	10/04/07	Facilitator:	Richard Hibbard	

10	UDOT Structures Dept	2.6.C.1	Replace what is there with "Design as per AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals (Current edition)"		
			Response: Change made.		
Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
11	UDOT Structures Dept	2.6.C	Be consistent with the use of lb or lbs. Need to use "lb" as per the spec writers manual.		
			Response: Change made.		
12	UDOT Structures Dept	2.6.E.1.c	FP-92 is really old. Maybe say (current edition) or do we have a standard that would work and let us drop this reference?		
			Response: Change made.		
13	UDOT Structures Dept	2.6.F.3	Do we need this? The anchor bolts are called out in 2.7 and 2.8. If we do, reference AASHTO M 111 instead of ASTM A 123 and ASTM F 1554, grade 55 instead of ASTM A 307.		
			Response: Changes made.		
14	UDOT Structures Dept	2.6.F.4	Add "Drilled Shaft. Refer to Section 02466."		
			Response: Added.		
15	UDOT Structures Dept	2.7.A	Not sure why we are increasing from 33 to 40 percent. If we don't have a good reason, we should stay with the standard. Also reference ASTM A 1011, Structural Steel grade 33, instead of A 570, grade 33.		
			Response: Changes made per industry standard.		
16	UDOT Structures Dept	2.7.D.1	Replace A 307 with F 1554, grade 55 and replace A 123 with AASHTO M 111.		
			Response: Change made.		
17	UDOT Structures Dept	2.7.D.2	Delete this line – it is covered in grade 55.		
			Response: Deleted.		
18	UDOT Structures Dept	2.8.A	Is there a reason why we are superseding the code? Those numbers are in the code, but in certain conditions the code says you can go higher. We recommend deleting this all except replace ASTM A 570, grade 33 with ASTM A 1011, Structural Steel grade 33.		
			Response: Changes made per industry standard.		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet

Review Comments

Std Dwg/Spec Number	16525	Sheet 3	of	7
Date:	10/04/07	Facilitator:	Richard Hibbard	

19	UDOT Structures Dept	2.8.B	Reference ASTM A 1011, Structural Steel grade 36, instead of A 570, grade 36.		
			Response: Per industry response, manufactures do not use A 1011, but rather A 572 and A 36. UDOT Structures was contacted and agree with this change.		

20	UDOT Structures Dept	2.8.C	Should say "Anchor bolts: Meet ASTM F 1554, grade 55"		
			Change made.		

21	UDOT Structures Dept	2.9.A.4	Lb instead of lbs		
			Response: Edit made.		

22	UDOT Structures Dept	2.15.B	Reference AASHTO M 111 instead of ASTM A 123.		
			Response: Pedestal spec has been completely revised.		

23	UDOT Structures Dept	2.17.B.1	Reference AASHTO M 111 instead of ASTM A 123.		
			Response: Change made.		

24	UDOT Structures Dept	3.2.A	Add "and Section 02466," at the end of this sentence.		
			Response: Addition made.		

25	Barry Sladek, Valmont	1.3	Add ASTM A 572: High-strength, Low-Alloy Columbium-Vanadium Structural Steel		
			Response: Added.		

26	Barry Sladek, Valmont	1.3	Add ASTM 595: Steel Tubes, Low-Carbon or High-Strength Low-Alloy, Tapered for Structural Use.		
			Response: Added.		

27	Barry Sladek, Valmont	1.3	Add ASTM 1554: Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength		
			Response: Added.		

28	Barry Sladek, Valmont	2.6.C.1	Current AASHTO code uses a 1.14 gust factor, therefore this should be 91 mph gusts rather than 105 mph.		
			Response: Altered to refer to AASHTO.		

29	Barry Sladek, Valmont	2.6.F.3	Add ASTM F 1554.		
			Response: Added.		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet

Review Comments

Std Dwg/Spec Number	16525	Sheet 4	of	7
Date:	10/04/07	Facilitator:	Richard Hibbard	

30	Barry Sladek, Valmont	2.7.A	Add ASTM A 595 grade A and ASTM A 572 grade 55.		
			Response: Added. Grade A and grade 55 refer to 55 ksi strength which we have set as a minimum.		

31	Barry Sladek, Valmont	2.7.C	Add ASTM A 36 and ASTM A 572 grade 50.		
			Response: Added.		

32	Barry Sladek, Valmont	2.7.D	Add ASTM F 1554.		
			Response: Added.		

33	Barry Sladek, Valmont	2.8.A	Add ASTM A 572 grade 55 and ASTM A 595 grade A		
			Response: Added. Grade A and grade 55 refer to 55 ksi strength which we have set as a minimum.		

34	Barry Sladek, Valmont	2.8.B	Add ASTM A 572 grade 50 and ASTM A 36.		
			Response: Added.		

35	Barry Sladek, Valmont	2.8.C	Add ASTM F 1554.		
			Response: Added.		

36	Mike Owens, GE	2.9.A.3	We can no longer provide the "split shell" socket design. We are now supplying the NEMA/ANSI approved socket with nickel plated brass.		
			Response: Changed to omit "split shell" and add NEMA spec.		

37	Mike Owens, GE	2.9.A.5	The "M" units will not accommodate the vertical range as specified in this paragraph. We do meet the vertical adjustment range as set forth in ANSI standard for horizontal mounting light fixtures.		
			Response: Changed to reflect ANSI standard.		

38	Troy Noall, Gades Traffic	2.6	You should verify that pole numbering meets current policy.		
			Response: Bill Butterfield of UDOT verified spec as written.		

39	James Wild, Union Metal	2.6.C.1	1994 AASHTO 80 mph produced a wind pressure (@24') of 28 #/sf. The latest AASHTO (due to different equations and gust factor) at 100 mph and 24' produces a wind pressure of 27.5 #/sf. If you're looking for similarly loading poles, you may want to increase the design windspeed.		
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Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet

Review Comments

Std Dwg/Spec Number	16525	Sheet 5	of	7
Date:	10/04/07	Facilitator:	Richard Hibbard	

			Response: Changed to refer to AASHTO spec.		
--	--	--	--	--	--

40	James Wild, Union Metal	2.6.F.3	the most commonly used anchor bolt spec. used by many DT's is F1554 in grades 55 & 105. The grade 55 provided bolts having a minimum yield of 55, 000 psi. Your current write up shows A307 & A123. A123 is a galvanizing specification. A307 (while it is an old and reliable specification) does not show a material yield, only a tensile, and AASHTO uses the yield to calculate allowable stresses.		
			Response: Changed to F 1554.		

41	James Wild, Union Metal	2.7.A	The allowable stress increase when designing for combinations including wind in the latest AASHTO is 33%. More common materials used for the pole tube itself are A570 Gr50, 60 & 65 and A595GrA.		
			Response: Changed to reflect industry standard.		

42	James Wild, Union Metal	2.7.D.1	anchor bolts - recommend F1554Gr55		
			Response: Changed to F 1554.		

43	James Wild, Union Metal	2.8.A	more commonly used is A570 or A572 Grade 50.		
			Response: Changed to reflect industry standard.		

44	James Wild, Union Metal	2.8.B	A570Gr36, or 50, or A36. Grade 50 is readily available. If you want to limit the strength used for design you could make a statement like - " use maximum yield stress of 36 ksi for design" - then the use of higher grade material only adds additional factors of safety.		
			Response: Change to A 572 grade 50. Will include A 36.		

45	James Wild, Union Metal	2.8.C	anchor bolts - recommend F1554Gr55		
			Response: Change made.		

46	Chip Barthlow, Myers Power	2.15.B.1.e	Please clarify the type of astronomical time clock? Digital or Electro-mechanical?		
			Response:		

47	Bill Butterfield, UDOT Highway Lighting Maintenance	16525	I and Le Lewis have looked at the spec and we are ok with it.		
			Response: Thanks.		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet

Review Comments

Std Dwg/Spec Number	16525	Sheet 6	of	7
Date:	10/04/07	Facilitator:	Richard Hibbard	

48	Roger K. Duncan, GE	2.10.C.3	The lamp wattage regulation is 1.5% for each 1% change in line voltage.		
			Response: Adjustment made.		

49	Paul Plasha, Mt States Lighting	2.8.D.3	Industry standard is 10-guage galvanized steel.		
			Response: Change made to reflect industry standard.		

50	Paul Plasha, Mt States Lighting	2.8.D.4	Alternate diameter cable sheaves have proven viable. Recommend omitting that requirement and leave spec to manufacturer.		
			Response: Agree. Omitted requirement.		

51	Paul Plasha, Mt States Lighting	2.8.D.5	Rather than "Centering arm" this should be defined as "Ring centering device." Different manufacturers have alternate methods which have a proven history.		
			Response: Agree. Changed verbiage.		

52	Paul Plasha, Mt States Lighting	2.9.C.3	Prismatic acrylic lens should be considered an option.		
			Response: Recommendation accepted. UDOT currently accepts acrylic lens as an option.		

53	Paul Plasha, Mt States Lighting	2.9.C	This should consider pendant mount lighting as well.		
			Response: Changed 2.9.C.4 to specify wall mount luminaires only.		

54	Paul Plasha, Mt States Lighting	2.10.B.4, D.4	Recommend specifying minimum temperatures that Utah climate typically has.		
			Response: Agree, changed to -20 F.		

55	Paul Plasha, Mt States Lighting	2.11.B.2, C.2, D.2	Color Rendering Index and CIE Chromaticity have little bearing on highway lighting. These types of lamps have little to no variability between manufacturers with regard to color.		
			Response: Agree. Eliminated from spec.		

56	Paul Plasha, Mt States Lighting	2.11.B	Recommend adding "Pulse start." Pulse start will increase the lamp life substantially.		
			Response: Agree. Added to spec.		

57	Paul Plasha, Mt States Lighting	2.11.C	Recommend adding "Non-cycling." Lighting maintenance crews can easily identify a malfunctioning HPS lamp when it is non-cycling.		
			Response: Agree. Added to spec.		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet		Review Comments		
Std Dwg/Spec Number	16525	Sheet 7	of	7
Date:	10/04/07	Facilitator:	Richard Hibbard	

58	Mike Owens, GE	2.9.A.3	We no longer manufacture the socket with a “free floating” center contact. All of the existing designs are cantilevered center contacts.		
			Response: Agree. Spec altered to reflect the change.		

59	Danny Michel, Ameron	2.7	We would like to add to the material list for lighting pole under 45 feet to include ASTM A 500 GR B Special Shapes.		
			Response: Denied. UDOT prefers poles that are round in cross-section.		

60	Tyler Yorgason, Civil Science	16525	Check entire document for grammar and punctuation.		
			Response: Will have a final edit before submission.		

61	Tyler Yorgason, Civil Science	3.1.D	I would change this sentence to read “Pothole, locate, or expose any utility that may conflict with drilling, trenching, or boring work associated with placement of highway lighting poles and conduit.”, to avoid implying any certainties with design utility data.		
			Response: Agree. Changed from “will” to “may.”		

62	James Wild, Union Metal	2.8	High mast poles should be Fatigue Category I for poles over 100’		
			Response: Agree. Spec altered to reflect this recommendation.		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

SECTION 16525

HIGHWAY LIGHTING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Materials and procedures for installing lighting for highway, understructure, sign, bridge, parking lot, and other lighting systems.

1.2 RELATED SECTIONS

A. Section 02466: Drilled Caisson~~A. Section 02741: Hot Mix Asphalt (HMA)~~

B. Section 02741: Hot Mix Asphalt (HMA)

CB. Section 02842: Delineators

DE. Section 02892: Traffic Signal

ED. Section 03055: Portland Cement Concrete

FE. Section 03211: Reinforcing Steel and Welded Wire

GF. Section 03575: Flowable Fill

HG. Section 05120: Structural Steel

IH. Section 09972: Painting for Structural Steel

J. Section ~~16135~~13554: Electrical Junction BoxesPolymer Concrete Junction Box

1.3 REFERENCES

- A. AASHTO M 111: Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Products
- B. AASHTO M 183: Structural Steel

- C. AASHTO Standard Specification Structures Supports for Highway Signs, Luminares, and Traffic Signals (current edition)
- ~~D. AASHTO M 232: Zinc Coating (Hot Dip) on Iron and Steel Hardware~~~~D.—ASTM A 123 (Cabinet): Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products~~
- ~~E. ASTM A 36: Carbon Structural Steel~~
- ~~FE.~~ ASTM A 307: Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength
- ~~G. F.—ASTM A 572: High-Strength Low-Alloy Columbium-Vanadium Structural Steel~~~~ASTM A 570, Grade 33: Steel, Sheet and Strip, Carbon Hot-Rolled Structural Quality~~
- ~~H. ASTM A 595: Steel Tubes, Low-Carbon or High-Strength Low-Alloy, Tapered for Structural Use~~
- ~~IG.~~ ~~ASTM F 1554: Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength~~~~ASTM A 576: Steel Bars, Carbon, Hot Wrought, Special Quality~~
- ~~JH.~~ ASTM B 3: Soft or Annealed Copper Wire
- ~~KI.~~ ASTM B 8: Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
- ~~LJ.~~ ASTM B 29: Refined Lead
- ~~MK.~~ ASTM B 117: Operating Salt Spray (Fog) Apparatus
- ~~NL.~~ ASTM B 766: Electrodeposited Coatings of Cadmium
- ~~OM.~~ American Iron & Steel Institute (AISI)
- ~~PN.~~ American National Standards Institute (ANSI)
- ~~QQ.~~ American Wire Gauge
- ~~RP.~~ Insulated Power Cable Engineers Association (IPCEA) Standards
- ~~SQ.~~ ITE/ANSI Lamp Codes
- ~~TR.~~ National Electric Code (NEC)
- ~~US.~~ National Electrical Manufacturers Association (NEMA)

| ~~VF.~~ National Fire Protection Association (NFPA)

| ~~WU.~~ Standard Specifications for Construction and Bridges on Federal Highway Projects

| ~~XV.~~ Underwriters Laboratories (UL)

1.4 SUBMITTALS

- | A. ~~Supply manufactures certification upon request. Samples of all materials.~~
- B. Wiring schematics, detailed shop drawings, and certifications within 15 calendar days after receiving the Notice to Proceed.
- C. Manufacturer's warranties, guarantees, instruction sheets, and parts lists.
- D. List of equipment and materials including name of manufacturer, size, and identification numbers. (Within calendar 15 days after receiving the Notice to Proceed).

1.5 QUALITY ASSURANCE

- A. Electrical components must conform to the requirements of the National Electrical Code. (NEC)

1.6 ACCEPTANCE

- | A. Lighting Warranties and Guarantee
1. The notice of acceptance for highway lighting work is not given until six months after the date of ~~the inspection~~ completion of punch list items.
 2. During this period, all manufacturer's warranties and guarantees on Contractor- furnished electrical and mechanical equipment are enforced.
 3. At the end of the period and after all electrical and mechanical defects within the scope of warranties and guarantees are corrected, the Engineer makes written acceptance of the work completed and relieves the Contractor of further responsibility for that portion of the project.
 4. Partial acceptance does not void or alter any terms of the Contract
- | B. The six-month warranty period for lighting does not affect the processing of a semi-final estimate when the Contract is 95 percent or more complete, or after completion of work on the project.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Wire and Cable: As per American Wire Gauge.
- B. Conductors:
 - 1. Wire up to 600 V: Single-conductor, copper cable with cross-link polyethylene insulation per ASTM B 3 and B 8, RHH-USE-RHW, as specified.
 - 2. Cable above 600 V: Conform to NEMA WC7. Single-conductor, stranded copper with full concentric neutral as specified.
- C. Ground wire: Bare, soft-drawn copper wire per NEC 250-1, as specified.
- D. Ground Rod: Copper-coated steel per ANSI/UL 467, as specified.
- E. Insulation: RHH-USE-RHW grade crosslink polyethylene compound.
- F. Splicing: Compression splice compatible with individual cable insulation and water seal for underground use. Comply with current UL code.
- G. Conduit: as indicated.
 - 1. Schedule 40 PVC and 80 PVC conduit and fittings rated at 200 degrees F as specified. NEMA TC-2/TC-3 UL.
 - 2. Galvanized rigid steel conduit and fittings as specified. Meet ANSI C 80.

2.2 JUNCTION BOXES

- A. Refer to Section ~~16135~~13554.

2.3 POWER CABLE ROUTE MARKER

- A. Meet ASTM B 29, alloy 5052-H38. 0.08 inch thick sheet aluminum as specified.
- B. White and red enamel paint: Refer to Section 09972.
- C. Mounting hardware: Refer to Section 05120.
- D. Flanged channel mount post: Refer to Section 02842.

2.4 SPLICE, MOLDED CONNECTOR, AND FUSE HOLDER

- A. Use individually insulated and water sealed compression splice.
- B. Use spring-loaded, molded connector and fuse holder with 90 percent minimum conductivity as per ANSI/UL 486A, as specified.

2.5 FUSE

- A. 600 V current limiting with 200,000 A interrupting rating. Meet UL Class CC.
- B. Light pole fuses with rating according to Table 1.

Table 1

Voltage	Wattage	Current (Amps)
120	250/400	20
208/240	250/400	15
277/480	250/400	10

- C. Lighting Circuit Fuses: Meet UL Class RK5, as specified.
- D. Service Disconnect Fuses: Meet UL Class R, as specified.

2.6 POLES - GENERAL

- A. Use tapered steel poles per SL Series Standard Drawings ~~and AASHTO Standard Specifications Structural Supports for Highway Sign, Luminaires and Traffic Signals (current edition).~~
- B. Galvanized per ~~AASHTO M 111~~ ASTM A-123, as specified.
- C. Performance criteria:
 - 1. Wind load: Design as per AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals (Current Edition) ~~80 mph wind with 105 mph gusts.~~
 - 2. Designed for luminaire weight of 77 lbs with projected area of 3.0 ft².
 - 3. Maximum allowable deflection of 4-3/4 inch (Deflection criteria is based on a 100 lb horizontal load applied at 6 inches below shaft top).
- D. Pole designated for decorative lighting:

1. Provide a festoon outlet located 16 ft from the base plate with duplex receptacle and weather-proof cover.
2. As per UL Listed.

E. Light Pole Numbers:

1. General:
 - a. Use 3 inch, Series C legend, green reflectorized sheeting as specified, with 1-inch vertical spacing between letters. The legend should read from top to bottom.
 - b. Use 4 inch wide, white reflectorized sheeting as specified for legend backing.
 - c. Meet Standard Specification for Construction and Bridges on Federal Highway Projects (Current Edition), ~~FP-92 type III Flexible~~, for reflective sheeting.

2. Mainline Lighting:

- a. Use mile marker to two decimal places for light pole identification (ID) number and a letter to show which circuit it is attached to.

- b. Example:

3	For light pole at mile marker 302.22
0	
2	
2	
2	
A	

3. Ramp Lighting:

- a. Specify the light pole ID number consisting of the following components: the exit number, the general direction (of the ramp, collector, or frontage), the light pole number in a series numbered in the direction of travel, and a letter to identify the electrical circuit.

- b. Use the following legend codes:

E = east	C = collector
W = west	F = frontage
N = north	
S = south	

- c. Example:

3	34 indicates exit number 34, WCN identifies
4	a westbound to northbound collector ramp,
W	2 designates the second pole in a series,
C	and the B references the electrical circuit.
N	
2	
B	

- F. Foundation:
1. Concrete: AA (AE). Refer to Section 03055.
 2. Coated reinforcing steel. Refer to Section 03211.
 3. Anchor bolts: Galvanized steel per AASHTO M 111~~ASTM A 307~~ and ASTM F 1554, grade 55~~A-123~~.
 4. Drilled caisson: Refer to Section 02466.

2.7 POLES - MOUNTING HEIGHT UNDER 45 FEET

- A. Allowable stresses for steel, as specified, in current AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaires and Traffic Signals, except increased 40 percent for Group II and Group III loading. Meet ASTM A 572~~570, Grade 33~~ and ASTM A 595 minimum yield 55 ksi. Meet Fatigue Category II.
- B. Breakaway base: SL Series Standard Drawings
- C. Steel Base Plate: Type NS, ASTM A 572 or ASTM A 595 minimum yield 55 ksi.
- D. Anchor bolts:
1. ~~Meet A~~ASHTO M 111~~STM A 307~~ and ASTM F 1554, grade 55~~123~~.
 2. ~~Minimum yield strength of 47,800 psi, as specified.~~
- E. Slip bolts:
1. Cadmium-plated Type NS
 2. With nuts and washers

2.8 POLES - MOUNTING HEIGHT OVER 45 FEET (HIGH MAST)

- A. Allowable steel stresses as specified in current AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaires and Traffic Signals. Meet ASTM A 572~~570, Grade 33~~ Grade 50. Meet Fatigue Category I for poles over 100 feet or higher and Fatigue Category II for poles under 100 feet.
1. ~~$F_b = 21,750 \text{ psi } (0.66 F_y)$~~
 2. ~~$F_v = 10,900 \text{ psi } (0.33 F_y)$~~
- B. Steel base-plate: ~~-~~ASTM A 572 grade 50, or ASTM A 36~~570, Grade 36, as specified.~~
- C. Anchor bolts: Meet ASTM F 1554, grade 55~~minimum yield strength of 55,000 psi as per ASTM A 576, as specified.~~

- D. High mast service hoist assembly:
1. Head frame: zinc, electroplated with yellow chromatic dip after fabrication, and a head frame cover of spun aluminum, and with six each 5 inches cast aluminum hoist cable sheaves with oil-impregnated, sintered-bronze bushings with stainless steel shaft.
 2. Aircraft Support cables: three each stainless steel ¼ inch, 7 x 19 aircraft cables x ¾ inch strand (minimum 3/16 inch).
 - ~~3. Latch shaft, cam, and hardware: stainless steel.~~
 - ~~34.~~ Luminaire support ring: minimum 107-gauge galvanized steel; rising rate of at least 12 ft/min.
 - ~~45.~~ Power cable sheaves: ~~minimum 6 inch diameter~~, brushed with oil-impregnated, sintered-bronze bushings with a stainless steel shaft.
 - ~~56.~~ Ring centering device ~~Centering arm~~: roller-contact, spring-loaded, water-resistant, non-marking roller on stainless steel shaft.
 - ~~6.~~ ~~7.~~ Winch: worm-gear driven, and self-locking, ~~with reversing electric motor.~~
 - ~~7.~~ Internal drive motor: UL Listed as heavy duty, reversing, with torque limiter.
- ~~E. Portable drive unit, UL Listed as heavy duty, reversing, with torque limiter, and 125 V transformer.~~

2.9 LUMINAIRE

- A. Highway luminaire: As specified, with die cast aluminum top housing, pre-wired integral ballasts with quick disconnect plugs mounted for ease of removal.
1. Reflectors, sockets, mounting cradles, and clamps fitted to upper housing.
 2. Optical assembly: formed aluminum reflectors with a chemically bonded, non-breakable, glass finish.
 3. Adjustable mogul base sockets: NEMA E39, nickel plated brass split-shell, tempered brass, lamp grips, cantilevered free-floating, spring-loaded, center contacts, and heat- and impact-resistant glass prismatic refractors.
 4. Weight: No more than 77 lbs with a projected area of not more than 3 ft².
 5. Mounting adjustment: Not less than 10 degrees above a horizontal position on reflector and refractor, and not less than 35 degrees of adjustment from a vertical position on the bracket arm.
 6. Glare shields: Steel or aluminum, when indicated on the plans.
- B. High mast luminaire: UL 1572, and as specified.
1. Symmetrical or asymmetrical with the asymmetrical capable of a 360 degrees rotation.
 2. Cast aluminum ballast, slipfitter mounts with adjustment of at least 3 degrees.
 3. Optical assembly: Open, ventilated, treated aluminum reflector. Enclosed and filtered, with heat and impact resistant tempered glass lens.

- C. Understructure luminaire: NEMA FA1-1973R1979, and as specified.
 - 1. Specifically designed for understructure application.
 - 2. Die-cast aluminum housing, vandal-proof fastener, integral ballast.
 - 3. Optical assembly: heat- and impact-resistant, tempered glass or prismatic acrylic lens, stainless steel lens guard.
 - 4. For wall mount: A adjustable sockets for minimum 60-degree beam angle.
- D. Sign bridge-Overhead sign luminaire: NEMA FA1-1973R1979, and as specified.
 - 1. Die-cast aluminum housing, die-cast aluminum door and integral glare shield, single piece, closed-cell gasket. Immunity to rain and snow damage.
 - 2. 1-~~3/4~~1 1/4 inch square conduit clamp support.
 - 3. ~~Refractor: shock and thermal resistant, borosilicate, prismatic.~~ Photometrics D designed specifically for sign illumination.
 - 4. ~~4. —~~ Integral ballast for high-pressure sodium or metal halide luminaires. Separate ballast housing for induction lamp luminaire.
 - 5. Weight: no more than 40 lbs with a projected area of not more than 2.5 ft².

2.10 LUMINAIRE BALLASTS

- A. Meet ANSI C82.4, C82.6 and C92.1; and ANSI/UL 1029.
- B. High pressure sodium ballast.
 - 1. Power Factor: must maintain 90 percent for nominal secondary load, and a least 70 percent for any 10 percent voltage variation.
 - 2. Lamp Wattage: maintain no more than 5 percent variation.
 - 3. Regulation: maintain no more than 35 percent for 10 percent line-voltage variation.
 - 4. Must start and operate at the rated lamp wattage at ambient temperatures down to ~~-20~~40 degrees F for the rated life of the lamp.
 - 5. Must sustain lamp operation for a minimum of 4 seconds at a voltage dip of 35 percent.
- C. ~~Mercury and~~ Metal Halide Ballast.
 - 1. Power Factor: minimum of 90 percent for a 10 percent voltage variation.
 - 2. Lamp Wattage: no more than 5 percent variation.
 - 3. Regulation: maintain no more than ~~15~~30 percent for 10 percent line-voltage variation.
 - 4. Must start and operate at the rated lamp wattage at ambient temperatures down to -13 degrees F for the rated life of the lamp.
 - 5. Must sustain lamp operation for a minimum of ~~4~~ seconds at a voltage dip of 40 percent.

D. Induction Lamp Ballast

1. Power Factor: minimum of 90 percent for a 10 percent voltage variation.
2. Lamp Wattage: no more than 5 percent variation.
3. Regulation: maintain no more than 30 percent for 10 percent line-voltage variation.
4. Must start and operate at the rated lamp wattage at ambient temperatures down to -20 degrees F for the rated life of the lamp.
5. Must maintain lamp operation for a minimum of 4 seconds at a voltage dip of 40 percent.

2.11 LAMP

- A. Heavy duty, long life incandescent (I) lamp, as specified. Meet ITE/ANSI lamp codes: I, M, H, and S.

~~B. Phosphor-coated mercury (M) lamp that uses or has:~~

- ~~1. Apparent color temperature of 3300 K.~~
- ~~2. CIE chromaticity of X = 0.410, Y = 0.385.~~
- ~~3. Rated life of no less than 24,000 hours at 10 hours per start-up.~~

~~CB.~~ Phosphor-coated metal halide (H) lamp that uses or has:

1. Correlated color temperature of 3800 K.
- ~~2. Pulse start. 2. CIE chromaticity of X = 0.390, Y = 0.388.~~
3. Rated life of no less than 15,000 hours at 10 hours per start-up.

~~DC.~~ Clear high pressure sodium (S) lamp that uses or has:

1. Apparent color temperature of 2100 K.
- ~~2. Non-cycling characteristics. 2. CIE chromaticity of X = 0.512, Y = 0.420.~~
3. Rated life of no less than 24,000 hours at 10 hours per start-up.

D. Induction lamp that uses or has:

1. Apparent color temperature of 3500 K to 4100 K.
2. Rated life of no less than 100,000 hours at 10 hours per start-up.

2.12 SERVICE DISCONNECT SWITCH

- A. Meet NEMA 3R K91, Type HD.
- B. 100 A Service disconnect switch with padlock, as specified.
- C. Circuit Breaker
1. 10,000 A interrupting rating for 240 V.
 2. 5,000 A interrupting rating for 480 V.

2.13 CONTROL EQUIPMENT

- A. Photocell control units.
 - 1. Meet ANSI 136.10, NEMA Base.
 - 2. Solid state photo cells that match input voltage, minimum 1800 V·A capacity.
 - 3. Crystal sensing devices with inverted turn-on and turn-off features.
 - 4. Fail safe in the “on” position. Turns on at $32 Lx \pm 10$ percent.
 - 5. Dedicated, inverted, control circuits with turn-off values of $19 lx \pm 25$ percent.
 - 6. Time delay range of 5 seconds to 10 seconds.
 - 7. Minimum 236 ft/lb metal oxide varistor lighting arrestors.
 - 8. Secondary sensor diodes and transient filters.
 - 9. Flame-retardant, high-impact covers, and acrylic windows with ultra-violet stabilizers.
 - 10. Clip voltage at 400 V.
- B. Lighting contactor:
 - 1. Hermetically sealed, steel tube mercury contacts.
 - 2. Manually operated, mechanically held contact.
 - 3. Remote, or photoelectric-operated, magnetic, electrically held contactor.
 - 4. Three-position slide selector with “on-off-auto” switch.
- C. Control Relay: Meet ANSI/IEEE C37.13, C37.27 and C62.41.
 - 1. Contact rating of 3,000 W minimum.
 - 2. Normally open.
 - 3. Multiple relay: Zinc/di-chromate-plated magnet; Class B insulation rating coil; Cadmium oxide contact, dual expulsion gap lightning arrester; valve type line arrester with no less than 650 V rating.
- D. Enclosure: NEMA 3R Type 4. Encase in a cabinet with padlock as specified.
- E. Circuit breaker UL rated at:
 - 1. 240 V at 10,000 A interrupting rating.
 - 2. 480 V at 5,000 A interrupting rating.

2.14 SUBSTATION

- A. ANSI C57.12.25 and C57.27 NEMA 260 (cabinet) as specified.
- B. 480 V secondary power, IOCA oil coolant, 150 degrees F temperature rise, 60 Hz frequency, $\pm 2 \frac{1}{2}$ percent voltage compensation taps.
- C. Foundation: Follow SL Series Standard Drawings

~~2.15 UNDERGROUND SERVICE PEDESTAL~~

- ~~A. Meet ASTM B 117, A 123 (cabinet), UL E 50076 as specified.~~
- ~~B. Galvanized Steel: Enclosure 0.12 inch, covers 0.08 inch. Meet ASTM A 123.~~
- ~~C. Bottom access opening; detachable, pad mount base; baffled ventilation louver.~~
- ~~D. Paint: Meet ASTM B 117. Environmental green, baked enamel over zinc chromate primer as specified.~~
- ~~E. Circuit Breaker: Main, with six space metered bus and six space un-metered bus.~~
- ~~F. Meter socket with safety socket test blocks.~~

2.15 LIGHTING POWER PEDESTAL

A. General requirements:

1. Power pedestal with base, NEMA 3R cabinet with gasket sealed access doors fabricated of 3.0 mm (0.120 inch) minimum thickness anodized aluminum. Continuously welded exterior cabinet and door seams with smooth seams and free of any voids. Design to be bolted down to a concrete foundation or pad from the inside of the pedestal.
2. Cabinet height 31-inches high plus or minus 3 inches.
3. Provide service entrance, meter, and distribution compartments separated by corrosion resistant barrier. Provide compartment access doors with stainless steel piano hinges. Hinges on left as viewed facing the cabinet. Provide provision for padlock.
4. Cabinet openings including ventilation holes designed to prevent entrance of insects (such as wasps, hornets, bees, etc.) and varmints when access panel and doors are closed.
5. Conform to UL508 Industrial Control Panel Labels for service entrance equipment requirements.
6. Sealed windows made of shatter resistant polycarbonate for photocell operation. Provide two windows and mounting brackets on opposite sides of the cabinet for the photocell. Locate the windows on the sides of the cabinet.
7. Provide pedestal documentation permanently attached to the inside of the distribution section.
8. Provide interior labels etched or engraved and mechanically fastened to the cabinet. Adhesives are not acceptable. Label front exterior of the cabinet "UDOT LIGHTING DISCONNECT."

B. Electrical requirements:

1. Rated for 200-amp, 1-phase, 3-wire, 120/240V or 240/480V service.

- a. 200-amp utility landing lugs to accommodate up to 250 MCM wire.
- b. Main breaker 200-amp, 2-pole.
- c. 12-circuit panel-board interior.
- d. Lighting contactor electrically held, 30-amp, 10-pole.
- e. Lighting control by either photocell module, or digital single channel astronomical time clock.
- f. Test switch with On-Off-Test settings.
- 2. Pre-wired according to NEC and NEMA Specifications.
- 3. Fully wired with UL approved copper XHHW-2 (or UL approved equivalent) cable bussing, fully rated.
- 4. Circuit breakers UL approved, bolt-on, industrial grade, and rated for 10K AIC minimum.

2.16 CONCRETE AND ASPHALT

- A. Concrete: Class AA (AE) Section 03055
- B. Hot Mix Asphalt: Section 02741
- C. Flowable Fill: Section 03575

2.17 HARDWARE

- A. Screws: Stainless steel
- B. Nuts, bolts, and washers:
 - 1. Galvanized: ASHTO M 111STM-A-123
 - 2. Cadmium-plated: ASTM B 766
 - 3. Type NS, as specified
- C. Mounting bands and buckles: stainless steel, ¾ inch wide, from 0.020 inch to 0.022 inches thick meeting AISI, Type 201.
- D. Padlock: Master, No. P-848.

PART 3 EXECUTION

3.1 PREPARATION

- A. Conform to the National Electrical Code (NEC).
- B. Coordinate State Furnished Materials:

1. Pick up at the Department's Central Warehouse, 4501 South 2700 West, Salt Lake City, UT. Contact the warehouse to schedule a pickup.
2. Pick up drop shipment materials at location specified.

~~A. Coordinate utility locations. Refer to Section 00727.~~

1. ~~Contact the appropriate power company at least 30 days before the desired connection date.~~
2. ~~Verify the exact location, voltage, procedures, and material required by the appropriate power company.~~

~~BC. Saw cut concrete or other improved surface that requires removal in the sidewalk area. Replace with in-kind material to match the existing grade. Contact power company at least 30 days before the connection date and verify the exact location, voltage, procedure, and materials required by the power company.~~

~~CD. Load, transport, and install State-furnished material. Pothole, locate, or expose any utility that may conflict with drilling, trenching, or boring work associated with placement of highway lighting pole and conduit.~~

~~E. Reuse materials only as specified or as approved by the Engineer.~~

3.2 **CONSTRUCT POLE FOUNDATION**

~~A. Construct foundation following Refer to SL Series Standard UDOT Drawings.~~

~~B. Refer to Section 02892.~~

~~C. Refer to Section 02466.~~

~~B. Do not weld reinforcing steel, conduit, or anchor bolts.~~

~~C. Tie reinforcing steel and conduit securely in place.~~

~~D. Place the concrete directly into the excavation. Use minimum forming.~~

~~E. Align and secure anchor bolts or extensions with a template.~~

3.3 **TRENCHING AND DIRECTIONAL BORING FOR CONDUIT** **TRENCHING**

A. Refer to Section 02892.

B. Conduit offset from roadway by more than 20 ft may be installed by plowing.

~~C. Installing high voltage power cable (exceeding 600 V);~~

- ~~1. Trench should be no more than 18 inches wide and at least 3 ft deep.~~
- ~~2. Place 3 inches of sand in the bottom of trench before installing cable.~~
- ~~3. Cover the power cables with at least 6 inches of sand.~~

3.4 INSTALL CONDUIT

- A. Refer to Section 02892.

3.5 INSTALL WIRING

- A. Refer to Section 02892.
- B. Install molded connectors on the cable so that the load side retains the fuse when it is disconnected at the cable's breakaway point.
- C. When splicing, use compression or bus barsplit bolt, and water sealproof as specified, meeting UL Listed.

- ~~D. When using 600 V or higher power cable:~~
 - ~~1. Provide a manufacturer's certified plot of X.Y. partial discharge.~~
 - ~~2. Perform a high voltage DC field test per the industry standard before connecting to the high voltage power source.~~
 - ~~3. Must meet Insulated Power Cable Engineers Association (IPCEA) standards.~~

3.6 INSTALL CONDUCTOR

- A. Install wiring in accordance with the appropriate articles of NFPA 70. Neatly arrange wiring within cabinets, junction boxes, etc.

3.7 INSTALL LUMINAIRES AND BALLASTS

- A. Immediately prior to installation, clean all light control surfaces, refractors, and reflectors to provide the maximum lumen output possible. Clean in accordance with the luminaire manufacturer's recommendations.
- B. Adjust luminaires with a level.
- C. Adjust sign bridge luminaires for optimum and uniform light distribution.
- D. High mast luminaire:
 - ~~1. Employ a representative from the luminaire company to optimize the light pattern.~~

2. Obtain manufacturer's certification that the service hoist operation is correctly installed.

3.8 INSTALL POWER SOURCE CONNECTION

A. Lighting pedestal: Refer to SL Series Standard Drawings. Install per manufacturer's recommendations.

B. Service disconnect switch:

A1. Install the grounded neutral conductor from secondary power source to the switch box.

B2. Install mounting bracket within 1 ft of both top and bottom of the switch box and within 3 ft of other cabinet or fitting.

C3. Provide and install material required by the appropriate power company.

D4. Install padlock on the switch box door and handle.

3.9 INSTALL SUBSTATION

A. Refer to SL Series Standard Drawings.

B. Coordinate work with local power company.

BC. Locate foundation in a well-drained area.

CD. Dig a trench and backfill for the primary power cable.

DE. Install padlocks on doors.

3.10 PHOTO-ELECTRIC CONTROL

A. Adjust to "North Sky" position.

3.11 POLE

A. Refer to SL Series Standard Drawings.

B. Center the shaft top over the center of the foundation after the arm extension, luminaire, and all accessories are in place or per the manufacturer's requirements.

- C. Install pole identification numbers at a 45 degree angle to approaching traffic. Remove old identification numbers without damage to galvanizing.
- D. Torque:
 - 1. Anchor bolts to 11 lb/ft.
 - 2. Slip bolts to 8 lb/ft, release, and re-torque to 6 lb/ft.
- E. When installing items on a pole:
 - 1. Do not drill steel pole.
 - 2. Use stainless steel mounting bands.

3.12 FIELD QUALITY CONTROL (ACCEPTANCE TESTS)

- A. Continuity of grounding conductor to maintain 1,000 watt load at circuit ends, maintaining 95 percent of supply voltage.
- B. Test for grounds in each circuit.
- C. Insulation resistance of supply conductor to ground shall be no less than 40 MΩ (500 V megger meter test).

3.13 SALVAGE

- A. Remove equipment to be reused or salvaged carefully so that it remains in the condition existing prior to its removal.
- B. Pole assembly remains the property of the Department. Transport to the location specified.
- C. Remove luminaire, arm, and conductor.
 - 1. Grease and reinstall fastener.
 - 2. Remove foundation to a depth of 6 inches below the existing surface and backfill with local material.
 - 3. Dispose of discarded junction box. Backfill with local material and compact to match adjacent area.

END OF SECTION

Standards Committee Submittal Sheet

Name of preparer: John Leonard
Title/Position of preparer: Traffic and Safety Operations Engineer
Specification/Drawing/Item Title: Work Zone Business Access Signing
Specification/Drawing Number: TC-5

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

New Drawing. This Drawing will standardize the way business accesses are identified and signed within construction zones.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

Existing Lump Sum Traffic Control

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

No Comments
Attached in Comment Resolution document.

ACEC Comments: (Use as much space as necessary.)

No Comments
Attached in Comment Resolution document.

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

List of all individuals attached.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

All Project Managers, all Preconstruction Engineers, all Traffic Engineers, all Maintenance Engineers, all Region and District Directors, and all members of the Standards Committee.

Construction Engineers

All Construction Engineers, Central Construction, and REs

Contractors (Any additional contacts beyond "C" above.)

None

Suppliers

None

Consultants (as required) (Any additional contacts beyond "C" above.)

None

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Anthony Sarahan. Roland Stanger has been a partner throughout the review process.

Others (as appropriate)

None

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

None

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

None

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

None

- F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

None---clarifies existing practice

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

None---clarifies existing practice

3. Life cycle cost.

None---clarifies existing practice

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Compliance with the MUTCD and uniform operating practices.

- H. Safety Impacts?

Compliance with the MUTCD and uniform operating practices.

- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Integral part of all projects, maintenance operations, and permitted operations that obstruct or impact business accesses.





Priority Explanation

Enter the appropriate priority in the box on the first page of the document.


- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

Message Id: 46F10C90.161 : 156 : 5649
Subject: New Standard Drawing TC 5, Business Access Signing
Created By: JLEONARD@utah.gov
Scheduled Date:
Creation Date: 09/19/07 11:48 AM
From: JOHN LEONARD

Recipients

Recipient	Action	Date & Time	Comment
 dot.gov	Transferred	09/19/07 11:49 AM	
CC: Roland Stanger (Roland.Stanger)			
 SRCOP01.SRDOMAIN	Delivered	09/19/07 11:48 AM	
To: Glenn Schulte (GSCHULTE)	Read	09/20/07 9:14 AM	
To: John Leonard (JLEONARD)	Read Forwarded	09/19/07 12:03 PM 09/25/07 3:51 PM	
CC: Kris Peterson (KRISPETERSON)	Deleted Emptied	09/19/07 12:23 PM 09/27/07 1:18 AM	
To: Larry Montoya (LMONTOYA)	Read	09/19/07 12:03 PM	
CC: Lynn Bernhard (LYNNBERNHARD)	Deleted	09/19/07 2:14 PM	
To: Michael Cuthbert (MBCUTHBERT)	Read Deleted	09/19/07 11:48 AM 09/19/07 3:45 PM	
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CC: Peter Negus (PNEGUS)			
CC: Stan Adams (STANADAMS)	Read	09/24/07 7:42 AM	
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To: Dennis Simper (DENNISSIMPER)			
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To: Rob Wight (RWIGHT)	Read Replied	09/19/07 1:03 PM 09/19/07 1:47 PM
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To: Greg Searle (GSEARLE)	Read Emptied	09/19/07 12:16 PM 09/24/07 6:00 PM
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To: Bret Sorenson (BSORENSEN)	Read Forwarded	09/21/07 12:19 PM 09/21/07 12:21 PM
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To: Troy Peterson (TLPETERSON)	Read	09/21/07 11:22 AM

Post Offices

Post Office	Delivered	Route
dot.gov		dot.gov
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SRTCPO1.SRDOMAIN	09/19/07 11:48 AM	utah.gov

Files

File	Size	Date & Time
MESSAGE	1302	09/19/07 11:48 AM
TC05JL.pdf	94324	09/19/07 11:27 AM

Options

Auto Delete:	No
Concealed Subject:	No
Expiration Date:	None
Notify Recipients:	Yes
Priority:	Standard
Reply requested by	None
Security:	Standard
Send Notification	when Opened
Send Notification	when Deleted
To Be Delivered:	Immediate

Standard Drawing/Specification Review Sheet		Review Comments		
STD DWG/Spec Number	TC 5	Sheet 1	of	2
Date:	October 2007	Facilitator:	John Leonard	

Review Comments Form

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
1	Danielle Herrscher, R-2 Traffic	TC-5	<p>Hello John,</p> <p>A couple comments regarding Std Dwg TC 5:</p> <p>1. If space allows, two signs should be used, one on left other on right side for traffic which will need to make a left turn into the business access. It may be difficult for approaching traffic to see the sign/access if there is queued traffic on the opposite side of the roadway.</p> <p>2. Recommend increased sign spacing for speeds greater than 40 MPH, may be 75-100'. For speeds 40 MPH or less, 25-50' should be adequate.</p> <p>Thanks, Danielle</p>	B	A
			Response: Allowed optional use of right side indication for opposing traffic. Sign advance spacing was defined as 25'-50' for 45 mph and less, and 50'-100' for speeds 50 mph and greater.		
2	Roland Stanger, FHWA.	TC-5	Opposing traffic should have a right side indication.	B	A
			Response: Allowed optional use of right side indication for opposing traffic		
3	Josh Van Jura, R-2 RE	TC-5	The 'maximum 10' spacing' should be reduced to 4' spacing on the devices channelizing the driveway. 10' and cars will pull out of the driveway into the work zone.	B	C
			Response: The note has been clarified that the maximum device spacing is 10' between devices. The RE and contractor always have the option of reducing the spacing.		
4	Rob Wight, R-2	TC-5	No comments.	A	A
			Response:		
5	Joe Kammerer, R-2, PM	TC-5	No comments.	A	A
			Response:		
6	Doug Bassett, R-3 Traffic	TC-5	No comments.	A	A
			Response:		
7	Fred Jenkins	TC-5	No comments.	A	A

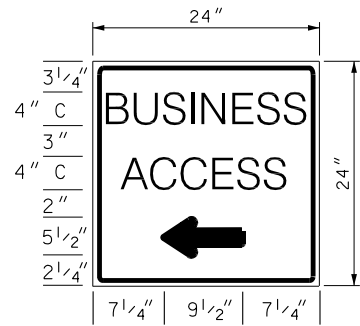
Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet		Review Comments		
STD DWG/Spec Number	TC 5	Sheet 2	of	2
Date:	October 2007	Facilitator:	John Leonard	

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
	R-4 RE		Response:		
8	Robert Westover, R-3	TC-5	No comments.	A	A
			Response:		
9	Clark Mackay, R-4 Construction	TC-5	No comments.	A	A
			Response:		
10	Mike Miles, R-4 PM	TC-5	No comments.	A	A
			Response:		
11	Robert Dowell, R-4 Richfield District Eng.	TC-5	No comments.	A	A
			Response:		
12	Brent Schvaneveldt, R-3 PM	TC-5	No comments.	A	A
			Response:		
13	Robert Markle, R-3 Traffic	TC-5	No comments.	A	A
			Response:		
14	Tyler Yorgason, ACEC	TC-5	Called when no written response. Tyler returned call and indicated that he saw no issues that would affect the ACEC members at this time.	A	A
			Response:		
15	Mont Wilson, AGC	TC-5	Called when no written response. Mont returned call and indicated that he saw no issues that would affect the AGC members at this time.	A	A
			Response:		

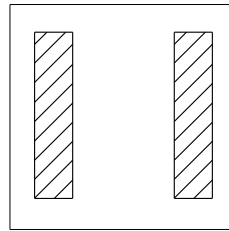
Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

10-OCT-2007 DGN: F:\et01\01\Standards\SpecSection\Standards Committee\Meeting\iles\2007\5-October25.07\Msg Drawings\TC05.dgn



FRONT

USE BLACK LEGEND ON
ORANGE RETROREFLECTIVE
SHEETING.



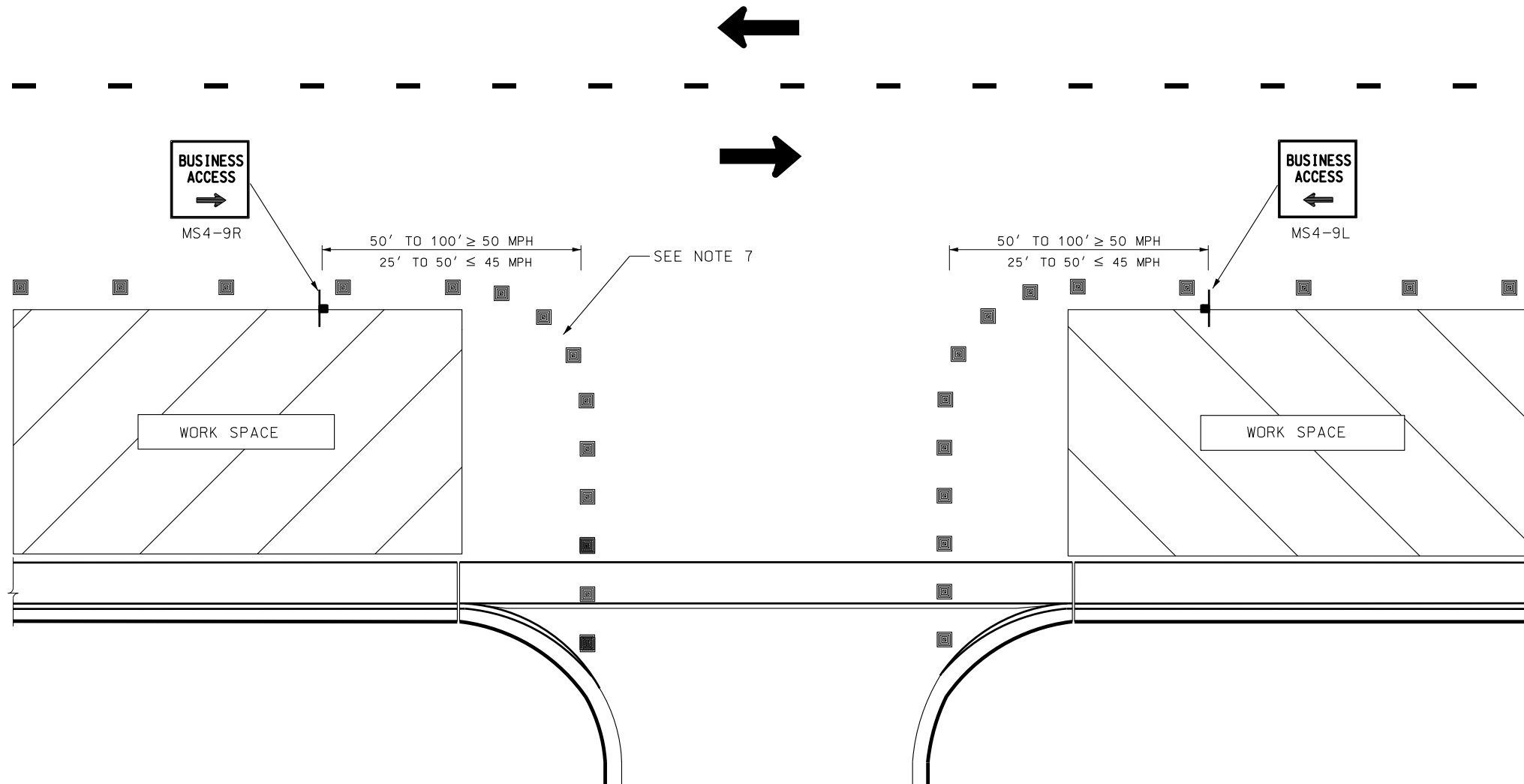
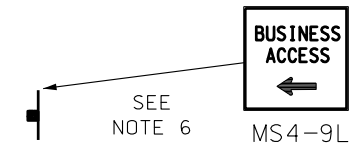
BACK

PLACE TWO 4" X 18" ORANGE
RETROREFLECTIVE STRIPS
VERTICALLY ON THE SIGN BACK.

MS4-9 BUSINESS ACCESS SIGN DETAILS

NOTES:

1. USE TO DEFINE BUSINESS ACCESS WITHIN WORK ZONES.
2. USE 5' MINIMUM MOUNTING HEIGHT.
3. USE JOINT ACCESS WHERE PRACTICAL.
4. CONSIDER USING DIFFERENT CHANNELIZING DEVICES TO HIGHLIGHT ACCESS (I.E., USE VERTICAL PANELS ALONG ROADWAY AND BARRELS WITHIN ACCESS LIMITS).
5. REFER TO STD DWG TC 3A FOR TRAFFIC CONTROL DEVICE LEGEND.
6. USE OF RIGHT SIDE MS4-9L SIGN IS OPTIONAL.
7. USE 10' MAXIMUM SPACING BETWEEN DEVICES IN DRIVEWAY.



EXAMPLE ONLY - NOT TO SCALE
SETUP TO BE SITE SPECIFIC

REVISIONS				REMARKS			
NO.	DATE	APPR.	DATE	NO.	DATE	APPR.	DATE
1	10/25/07	JL					
NEW DRAWING.							

UTAH DEPARTMENT OF TRANSPORTATION			
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION			
SALT LAKE COUNTY			
RECOMMENDED FOR APPROVAL			
CHAIRMAN STANDARDS COMMITTEE			
APPROVED			
DEPUTY DIRECTOR			
DATE		DATE	
APR.26.2007		APR.26.2007	

WORK ZONE BUSINESS ACCESS SIGNING

STANDARD DRAWING TITLE

STD. DWG. NO.
TC 5

Standards Committee Submittal Sheet

Name of preparer: Wes Starkenburg
Title/Position of preparer: Operations Design Engineer
Specification/Drawing/Item Title: DD 5A and 5B Entrance Ramps and
Exit Ramps at Crossroads
Specification/Drawing Number: DD 5A. DD5B

Enter appropriate priority level:

(See last page for explanation) 3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Previous drawing DD 5 was split into 5A and 5B to allow graphics on the drawing to be shown at a larger, more readable scale. Splitting the drawing into 2 drawings requires that it be reviewed by the full Standards Committee

Lane transitions on each drawing were corrected to 15:1 rather than the 90' previously shown

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

No change to measurement and payment

C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

Submitted to Mont Wilson, per follow up call he has no comments

ACEC Comments: (Use as much space as necessary.)

Submitted to Tyler Yorgason, per follow up call he has no comments

D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

See attached distribution list

Construction Engineers

See attached distribution list

Contractors (Any additional contacts beyond "C" above.)

Minimal effect on contractors. Contacted AGA only

Suppliers

These changes have no significant effect on suppliers

Consultants (as required) (Any additional contacts beyond "C" above.)

Contacted ACEC only

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

FHWA worked with us while making proposed changes and has been included in this current review.

Others (as appropriate)

None

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

No significant changes to measurement and changes

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

No changes to business systems

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Will be included in publication of next (2008) changes to standards

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

No anticipated changes to bid item price

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

No anticipated changes to operational costs.

3. Life cycle cost.

No anticipated change to lifecycle costs

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.)
(Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Made minor correction. Made drawings easier to read.

H. Safety Impacts?

No significant impacts to safety.

I. History? Address issues relating to the current usage of the item and past reviews,
approvals, and/or disapprovals.

No recent history

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect **four weeks** later for projects being advertised.

Subject: Standard Drawings DD 5A DD 5B
Created By: WSTARKENBURG@utah.gov
Scheduled Date:
Creation Date: 9/18/2007 4:28 PM
From: Wes Starkenburg

Recipient	Action	Date & Time	Comment
To: Anthony Sarhan (anthony.sarhan)	Transferred	9/18/2007 4:29 PM	
CC: Barry Axelrod (BAXELROD)	Read	9/19/2007 6:20 AM	
To: Betty Purdie (BPURDIE)	Read	9/18/2007 5:14 PM	
To: Bill Lawrence (BILLLAWRENCE)	Read	9/19/2007 9:12 AM	
To: Boyd Wheeler (BWHEELER)	Read	9/18/2007 6:37 PM	
To: Brent Schvaneveldt (BSCHVANEVELDT)	Read	9/20/2007 12:55 PM	
To: Bret Sorenson (BSORENSEN)	Read	9/18/2007 6:28 PM	
To: Clark Mackay (CLARKMACKAY)	Read	9/27/2007 2:28 PM	
To: Dennis Simper (DENNISSIMPER)	Read	9/19/2007 1:28 PM	
To: Erik Brondum (EBRONDUM)	Transferred	9/18/2007 4:28 PM	
To: Joe Kammerer (JKAMMERER)	Read	9/19/2007 8:20 AM	
To: Kevin Griffin (KGRIFFIN)	Read	9/18/2007 7:52 PM	
CC: Lynn Bernhard (LYNNBERNHARD)	Delivered	9/18/2007 4:28 PM	
To: Merrell Jolley (MERRELLJOLLEY)	Delivered	9/18/2007 4:28 PM	
To: Mike Miles (MMILES)	Read	9/26/2007 9:08 AM	
To: Mont Wilson (mont.wilson)	Transferred	9/18/2007 4:28 PM	
To: Nathan Lee (NLEE)	Read	9/18/2007 4:40 PM	
To: Nathan Merrill (NMERRILL)	Read	9/18/2007 4:50 PM	
To: Nathan Peterson (NATEPETERSON)	Read	9/19/2007 9:42 AM	
To: Randy Park (RPARK)	Read	9/20/2007 8:07 AM	
To: Rex Harris (REXHARRIS)	Delivered	9/18/2007 4:28 PM	
To: Richard Clarke (RICHARDCLARKE)	Read	9/19/2007 11:26 AM	
To: Rick Torgerson (RTORGERSON)	Delivered	9/18/2007 4:28 PM	
To: Rob Wight (RWIGHT)	Read	9/19/2007 8:44 AM	
To: Robert Hull (RHULL)	Delivered	9/18/2007 4:28 PM	
CC: Robert Miles (ROBERTMILES)	Read	9/18/2007 6:58 PM	
To: Robert Westover (RWESTOVER)	Read	9/19/2007 7:04 AM	
To: Rukhsana Lindsey (RLINDSEY)	Read	9/26/2007 11:20 AM	
To: Scott Andrus (SCOTTANDRUS)	Read	9/18/2007 4:35 PM	
To: Scott Nussbaum (SNUSSBAUM)	Read	9/25/2007 1:13 PM	
To: Stan Burns (SBURNS)	Read	9/19/2007 9:51 AM	
To: Steve Ogden (SOGDEN)	Delivered	9/18/2007 4:28 PM	
To: Tim Biel (TBIEL)	Read	9/19/2007 9:24 PM	
To: Tyler Yorgason (tyorgason)	Transferred	9/18/2007 4:28 PM	
BC: Wes Starkenburg (WSTARKENBURG)	Read	9/18/2007 4:28 PM	

Std Dwg/Spec Number	DD 5A and 5B	Sheet 1	of	2
Date:	9/19/07	Facilitator:	Wes Starkenburg	

Review Comments Form

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
1	Bill Lawrence	DD 5B	Move section A-A to the correct location Response: Will move	A	A
2	Nathan Peterson	DD 5A	I'm a little confused on type "b" detail. They way that I read it the radii for the north or up side of the intersection is when you have curb and gutter, and the south or down side is paved shoulder with standard side slope with no curb and gutter. Is this the right interpretation of the detail? If so you may want to include a leader in the drawing saying so. Response: Will include leaders	A	A
3	Mike Miles	DD 5B	Where on the Island Detail is the cross section A-A located? Also, it is a bit confusing for me to see the "edge of traffic lane" over natural ground in Section A-A. Response: See plan view for where section A-A is cut (moved slightly to correct location). Removed natural ground symbol	A	A
4	Roland Stanger	DD 5A DD 5B	OK Response	A	A
6	Brent Schavanevedlt	DD 5A DD 5B	No Comment Response:	A	A
7	Joe Kammerer	DD 5A DD 5B	No Comment Response:	A	A
8	Kevin Griffin	DD 5A DD 5B	No Comment Response:	A	A
10	Mike Miles	DD 5A DD 5B	No Comment Response:	A	A
11	Mont Wilson (AGC)	DD 5A DD 5B	No Comment Response:	A	A
12	Nathan Petersonle	DD 5A DD 5B	No Comment Response:	A	A
13	Robert Westover	DD 5A DD 5B	No Comment Response:	A	A

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

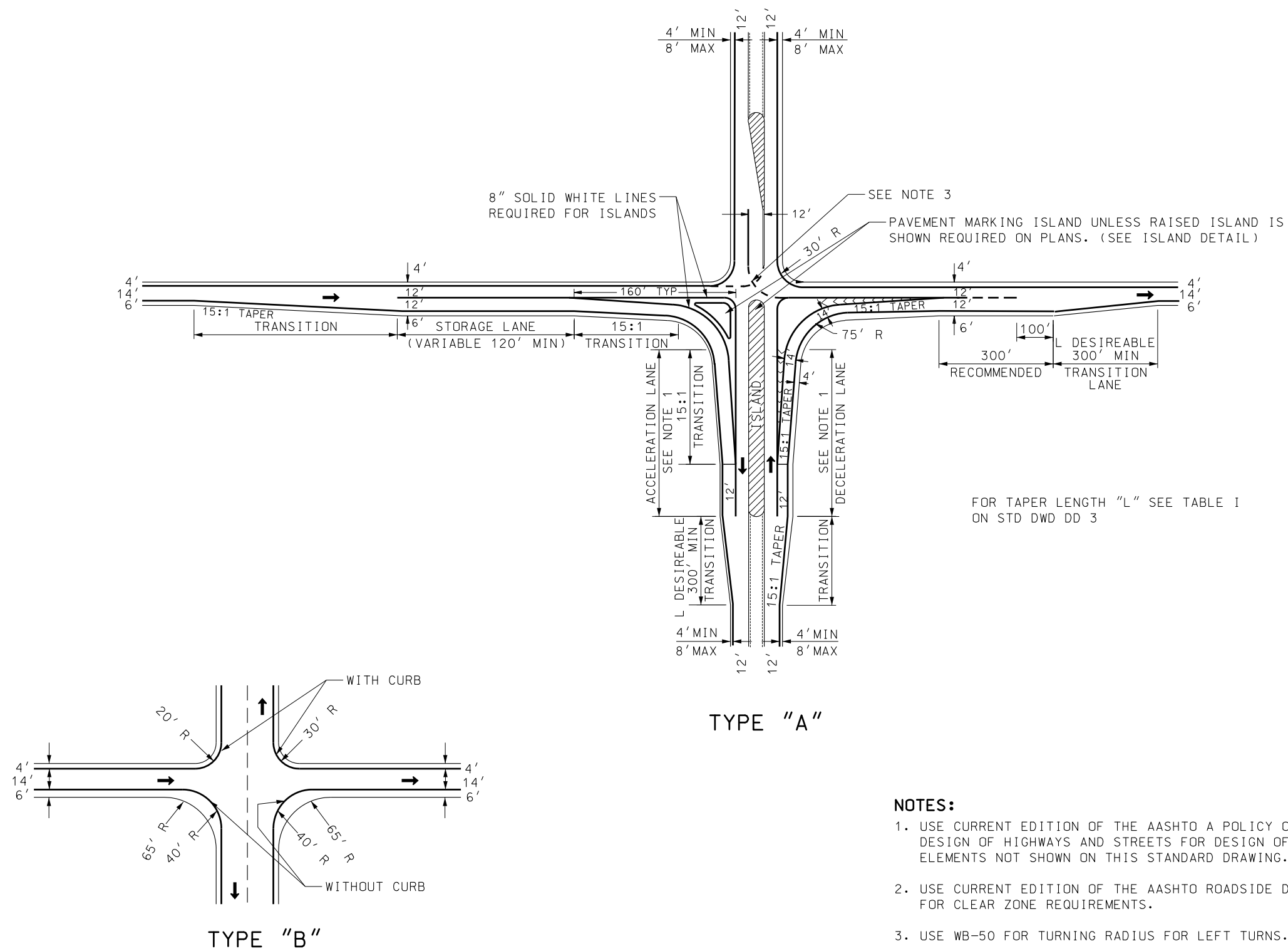
Standard Drawing/Specification Review Sheet			Review Comments		
Std Dwg/Spec Number	DD 5A and 5B		Sheet 2	of	2
Date:	9/19/07		Facilitator:	Wes Starkenburg	

14	Richard Clarke	DD 5A DD 5B	No Comment	A	A
			Response:		

15	Scott Andrus	DD 5A DD 5B	No Comment	A	A
			Response:		

16	Tyler Yorgason (ACEC)	DD 5A DD 5B	No Comment	A	A
			Response:		

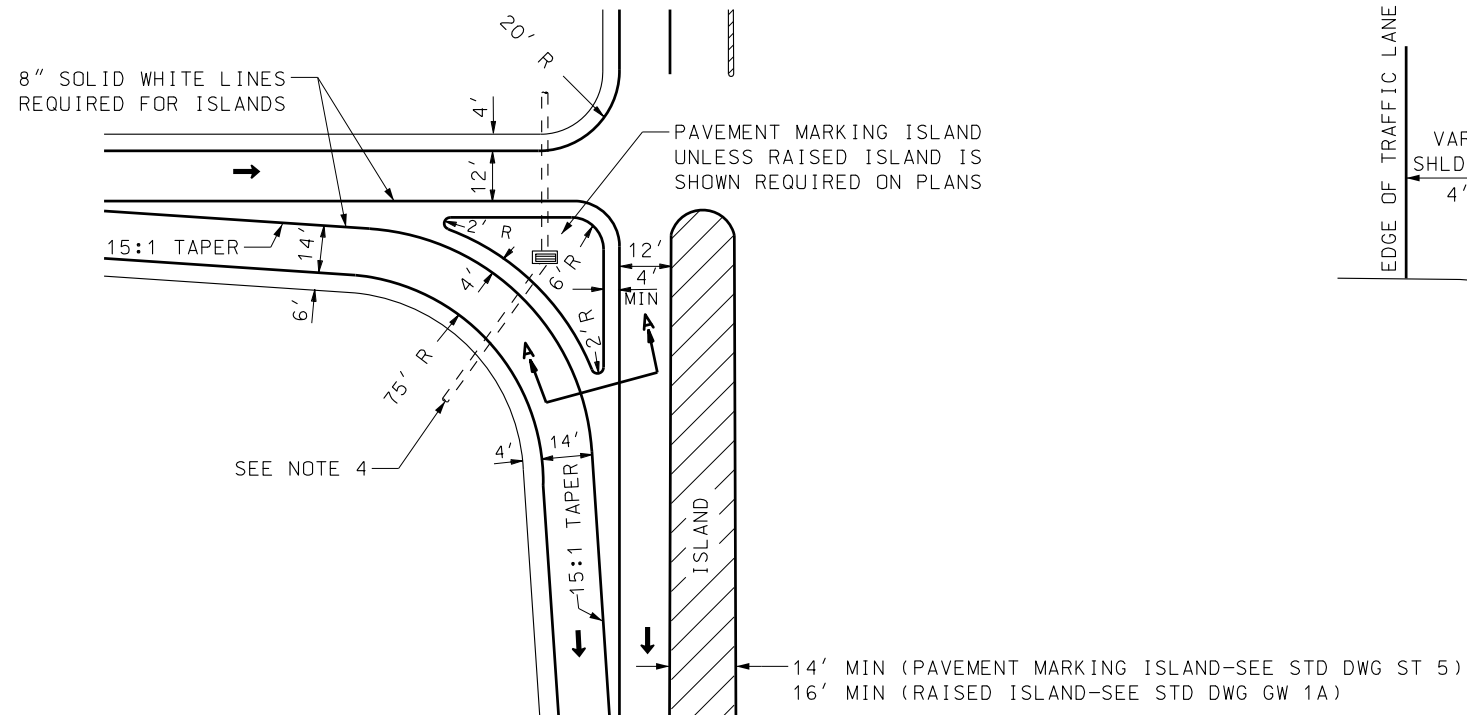
Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate



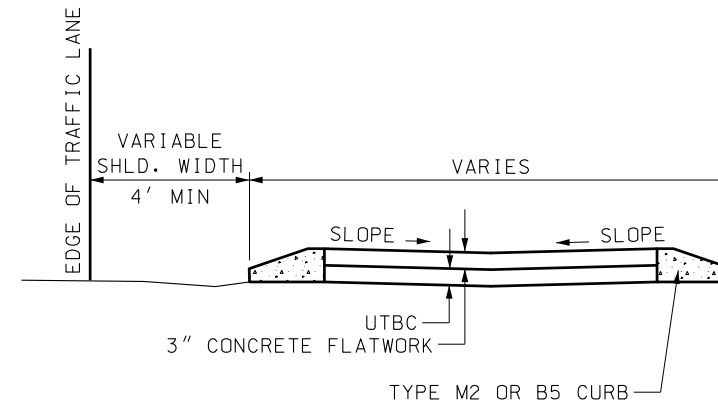
- ### NOTES:
1. USE CURRENT EDITION OF THE AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS NOT SHOWN ON THIS STANDARD DRAWING.
 2. USE CURRENT EDITION OF THE AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS.
 3. USE WB-50 FOR TURNING RADIUS FOR LEFT TURNS.
 4. PROVIDE DRAINAGE FROM CATCH BASIN IN RAISED ISLAND AREA.
 5. LANE WIDTHS SHOWN ARE TYPICAL.
 6. STANDARDS SHOWN ARE RECOMMENDED VALUES. EXCEED STANDARDS IF CONDITIONS PERMIT.

STANDARD DRAWING TITLE		ENTRANCE AND EXIT RAMPS AT CROSSROADS	
STANDARD DWG		DD 5A	
REVISIONS		1 08/23/07 J.L. SPLIT DRAWING DD 5 INTO DD 5A AND DD 5B	
UTAH DEPARTMENT OF TRANSPORTATION		STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION SALT LAKE COUNTY	
RECOMMENDED FOR APPROVAL		JAN. 01, 2005 DATE	
CHAIRMAN, STANDARD COMMITTEE		JAN. 01, 2005 DATE	
APPROVED			
DESIGN PROJECT			

ISLAND DETAIL



SECTION A-A



NOTES:

1. USE CURRENT EDITION OF THE AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS NOT SHOWN ON THIS STANDARD DRAWING.
2. USE CURRENT EDITION OF THE AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS.
3. USE WB-50 FOR TURNING RADIUS FOR LEFT TURNS.
4. PROVIDE DRAINAGE FROM CATCH BASIN IN RAISED ISLAND AREA.
5. LANE WIDTHS SHOWN ARE TYPICAL.
6. STANDARDS SHOWN ARE RECOMMENDED VALUES. EXCEED STANDARDS IF CONDITIONS PERMIT.

[illegible]

Standards Committee Submittal Sheet

Name of preparer: Ray Cook
Title/Position of preparer: Senior Design Engineer
Specification/Drawing/Item Title: New Specifications: Dampproofing & Concrete Coating
Specification/Drawing Number: 07111 & 09981

Enter appropriate priority level:

(See last page for explanation) **2008**

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Section 07111, Dampproofing – New standard specification recommended by UDOT Project Engineer for application to concrete box culverts during the review of that specification. Dampproofing will be applied to concrete structure elements such as box culverts and possibly abutments when specified on the plans.

Section 09981, Concrete Coating – New standard specification created to address providing colored coating to concrete surfaces. Specification is based upon the special provisions used on the I-15 Reconstruction, Legacy Parkway and other UDOT projects. Concrete surfaces will be coated (stained) as specified in the plans or specifications. This could apply to bridges, retaining walls, noise walls and barriers.

Note that during the review period it was determined that the title of Section 09981 should be changed from Concrete Staining to Concrete Coating. This will require updating Section 02861 Precast Noise and Retaining/Noise Walls to reflect this change.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

Section 07111: Dampproofing

#	071110010	Dampproofing (Est. Qty. _____ sq ft.)	Lump Sum
Includes all labor, equipment, and materials necessary to complete the item.			

Section 09981: Concrete Coating

#	099810010	Concrete Coating (Est. Qty. _____ sq ft.)	Lump Sum
Includes all labor, equipment, and materials necessary to complete the item. Use when not included in other items of work.			

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

Email sent to Mont Wilson, AGC, 9/21/07. No response received.

ACEC Comments: (Use as much space as necessary.)

Email sent to Tyler Yorgason, ACEC, 9/21/07. Response received indicating no comments.

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Sent by email to the following on 9/21/07:

Region District Engineers

Reg 1, Kevin Griffin – No reply
Reg 1, Denis Simpir – No reply
Reg 2, Betty Purdie – No reply
Reg 2, Rob Wight – No reply
Reg 3, Bob Westover – No comments
Reg 3, Scott Andrus – No reply
Reg 4, Hugh Kirkham – No reply
Reg 4, Robert Dowell – No comments
Reg 4, Jim McConnell – No reply

Region Materials Engineers

Reg 1, Rodney Terry – No reply
Reg 2, John Butterfield – No reply
Reg 3, Jim Cox – No comments
Reg 4, Larry Gay – No reply

Region Preconstruction Engineers

Reg 1, Rex Harris – No reply
Reg 2, Bill Lawrence – No reply
Reg 3, Brent Schvaneveldt – No comments
Reg 4, Mike Miles – No comments

Construction Engineers

(See District Engineers)

Contractors (Any additional contacts beyond “C” above.)

None.

Suppliers

Sent Section 07111 (Concrete Coating) by email to the following:

Stephanie Loud, Mountain West Precast – No reply
Jeremy McIntyre, Precast Concrete Products – No reply; follow-up phone
conversation – no comments.
Dave Gilley, Harper Precast – No reply.
Ryan Treanor, Howell Precast – No reply.
Michael Steed, Sherwin Williams – No reply.

Consultants (as required) (Any additional contacts beyond “C” above.)

None.

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Anthony Sarhan, FHWA – No reply.

Others (as appropriate)

Tim Biel, Central Materials – See attached for comment.

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

No change. Treated the same as penetrating concrete sealers (03392).

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

New bid items as noted under Measurement & Payment

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

N/A

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

Dampproofing – Estimated on the Legacy Parkway Project as approximately \$5000 per box culvert. Considered well worth the cost.

Concrete Coating – Estimated as approximately \$0.25 / sq ft.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

Maintenance – Concrete coating may require re-staining at end of stain life.

Advantage: Concrete coating allows UDOT to re-coat over graffiti.

3. Life cycle cost.

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

More aesthetically pleasing bridges and walls that are better received by the community and are more consistent with CSS principles.

- H. Safety Impacts?

N/A

- I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Concrete coating has been used on all UDOT design-build projects and many traditional design-bid-build projects to provide color to concrete. The proprietary special provision has been made more generic for the standard specification.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

UDOT STRUCTURES DIVISION COMMENT AND RESOLUTION SHEET

CODES:

- A. ACCEPT COMMENT—WILL BE CORRECTED, ADDED, OR CLARIFIED.**
B. DESIGNER WILL EVALUATE.
C. DELETE COMMENT
D. DEPARTMENT TO EVALUATE.

DOCUMENT CONTROL NUMBER: N/A			REVIEW TYPE: STANDARD SPECIFICATION		REVIEWER(S): VARIOUS		DATE: 10/03/07	
DESCRIPTION: STANDARD SPECIFICATIONS FOR DAMPPROOFING & CONCRETE COATING			DESIGNER: UDOT STRUCTURES		DISCIPLINE: STRUCTURES		CRM:	
ITEM No.	DWG. No.⁽¹⁾	COMMENTS	CODE⁽²⁾	RESPONSE⁽²⁾			FINAL DISPOSITION⁽³⁾	
TIM BIEL, UDOT MATERIALS								
1	09981, 1.5	My only question is: What is the purpose of the 1 quart sample of stain in Section 09981? Who does it get submitted to? What tests or evaluation will be run on it?	A	<p>The concrete coating product is an opaque penetrating concrete sealer that is tinted to provide the color. Based upon discussions with Bryan Lee and Sara Carlock, concrete sealers are tested similar to paints. Requirements are similar to those in Section 03392, Penetrating Concrete Sealer.</p> <p>All submittals are submitted to the Resident Engineer who then forwards it to Materials. According to Sara, the concrete coating is tested as a concrete sealer with an infrared test to fingerprint it. It is then compared to standards that Sara has on file.</p> <p>Since the testing is not related to color, the specification will be changed to only require one sample, instead of one per color.</p>				
MARK RYAN, SOLOMON COLOR								
1	09981, G	The described product is more of a concrete coating than a concrete stain. This may be confusing to some who consider a stain to be transparent or semi-transparent.	A	<p>Agree. Specification title and product description will be changed to Concrete Coating. This will also require some minor modification to Section 02861, Precast Concrete Noise and Retaining/Noise Wall.</p>				

- (1) Indicate drawing no./page no. or use "G" for general comment.
 (2) To be filled out by Designer.
 (3) To be determined in subsequent comment resolution meeting/discussion (list date).

Note: The intended use of this form is to provide a means for the Department to comment on submitted structural design plans and calculations. All comments must be satisfactorily resolved and incorporated into the contract documents before the design can be approved.

SECTION 07111

DAMPPROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Application of primer and seal coat to damp proof concrete surfaces in accordance with the specifications and plan details.

1.2 RELATED SECTIONS Not Used

1.3 REFERENCES

- A. ASTM D 41: Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing
- B. ASTM D 449: Standard Specification for Asphalt Used in Dampproofing and Waterproofing
- C. ASTM D 1227: Specification for Emulsified Asphalt Used as a Protective Coating for Roofing
- D. ASTM D 4263: Standard test method for indication of moisture in concrete
- E. ASTM D 4479: Specification for Asphalt Roof Coatings—Asbestos Free

1.4 DEFINITIONS Not Used

1.5 SUBMITTALS

- A. Product Data for each material proposed for use. Include recommendations for method of application, primer, number of coats, coverage or thickness, and protection course.
- B. Material Certificates for each product, signed by manufacturers.

1.6 QUALITY ASSURANCE

- A. Source Limitations:
 - 1. Obtain primary dampproofing materials and primers through one source from a single manufacturer.
 - 2. Provide secondary materials recommended by manufacturer of primary materials.

1.7 PROJECT CONDITIONS

- A. Weather Limitations:
 - 1. Proceed with installation only when existing and forecasted weather conditions permit dampproofing to be performed according to manufacturer's written instructions.

PART 2 PRODUCTS

2.1 PRIMER

- A. Use asphalt for primer that complies with ASTM D 41.

2.2 SEAL COAT

- A. Use one of the following:
 - 1. Hot-Applied Asphalt Seal Coat: ASTM D 449, Type I.
 - 2. Cold-Applied Asphalt Seal Coat: ASTM D 4479, Type I (asbestos-free)
 - 3. Cold-Applied Emulsified Asphalt Seal Coat: ASTM D 1227, Type III or IV.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with installer present, for compliance with requirements for surface smoothness and other conditions affecting performance of work.
 - 1. Proceed with dampproofing application only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.
 - 2. Test for surface moisture according to ASTM D 4263.

3.2 PREPARATION

- A. Comply with manufacturer's recommendations for surface preparation.
- B. Clean substrates of projections and substances detrimental to work.
 - 1. Fill voids, seal joints, and apply bond breakers if any, as recommended by prime material manufacturer.
 - 2. Where necessary, the Engineer may require the surface to be scrubbed with water and a stiff brush.
 - 3. Allow the surface to dry before applying the primer.
- C. Apply patching compound for filling and patching tie holes, honeycombs, reveals, and other imperfections.
- D. Protection of Other Work:
 - 1. Mask or otherwise protect adjoining exposed surfaces from being stained, spotted, or coated by dampproofing.
 - 2. Prevent dampproofing materials from entering and clogging weep holes and drains.

3.3 APPLICATION, GENERAL

- A. Apply dampproofing to concrete surfaces as shown on the plans or as specified.
- B. Comply with manufacturer's written recommendations unless more stringent requirements are indicated or required by project conditions to ensure satisfactory performance of dampproofing.
 - 1. Apply additional coats if recommended by manufacturer or if required to achieve coverage indicated.
 - 2. Allow each coat of dampproofing to cure as per prime material manufacturer's recommendations before applying subsequent coats.
 - 3. Allow drying time prior to backfilling as per prime material manufacturer's recommendations.
- C. Apply dampproofing to provide a continuous plane of protection on specified concrete surfaces.
 - 1. Lap dampproofing at least 6 inches onto intersecting concrete members such as wingwalls and headwalls.
 - 2. Extend dampproofing 6 inches below top of base slab on concrete box culverts three-sided structures.

3.4 HOT-APPLIED ASPHALT SEAL COAT

- A. Do not apply hot asphalt when substrate condition causes foaming.
- B. Kettle Temperature:
 - 1. Comply with dampproofing material manufacturer's written recommendations, and keep at least 25 degrees Fahrenheit below the flash point.
- C. Prime masonry and other porous substrates.
- D. Apply a uniform coat of hot asphalt by mopping or spraying at not less than 20 lb or 2.5 gal/100 sq ft.
- E. Apply a second coat as specified above.
 - 1. Apply double thickness of second coat where first application has failed to produce a smooth, shiny, impervious coat.

3.5 COLD-APPLIED ASPHALT SEAL COAT

- A. Apply two brush or spray coats at not less than 1.25 gal/100 sq ft for first coat and 1 gal/100 sq ft for second coat, or 1 trowel coat at not less than 4 gal/100 sq ft.

3.6 COLD-APPLIED EMULSIFIED ASPHALT SEAL COAT

- A. Apply two brush or spray coats at not less than 1.5 gal/100 sq ft for first coat and 1 gal/100 sq ft for second coat, 1 fibered brush or spray coat at not less than 3 gal/100 sq ft, or 1 trowel coat at not less than 4 gal/100 sq ft.

3.7 CLEANING

- A. Remove dampproofing materials from surfaces not intended to receive dampproofing.

END OF SECTION

SECTION 09981

CONCRETE COATING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Prepare concrete surfaces and apply a tinted concrete coating system to the areas designated to be coated as shown on the plans and as specified.
- B. Prepare concrete surfaces and re-apply concrete coating over graffiti for a period not to exceed final owner acceptance.

1.2 RELATED SECTIONS Not Used

1.3 REFERENCES

- A. ASTM D 4262: Standard Test Method for pH of Chemically Cleaned or Etched Concrete Surfaces
- B. ASTM D 4263: Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method

1.4 DEFINITIONS Not Used

1.5 SUBMITTALS

- A. Product data for each material proposed for use.
 - 1. Include manufacturer's technical information, and manufacturer's recommendations for surface preparation and application for each material proposed for use.
- B. Submit a one quart sample for testing, manufacturer's certificate of compliance, and laboratory test results using infrared techniques for the concrete coating system.
- C. Submit for approval three 8-1/2 inch by 11 inch samples of each concrete coating color required on the project before ordering concrete coating materials.

1.6 FIELD EVALUATION

- A. Apply the full color palate to one area of the concrete to be coated for evaluation of the color scheme by the Engineer before the full application of the concrete coating system.

PART 2 PRODUCTS

2.1 CONCRETE COATING SYSTEM

- A. Use a silicone acrylic concrete sealer that provides a durable, opaque, deep penetrating, water repellent, decorative finish to concrete and masonry surfaces.
- B. Tint the sealer to provide the colors as shown on the plans or as specified.

PART 3 EXECUTION

3.1 GENERAL

- A. Use only one coating material on an individual structure.
- B. Furnish, prepare, apply, cure and store all materials according to the product manufacturer's directions and as specified herein.
 - 1. Give special attention to the recommended temperature range for application.
 - a) Material subjected to freezing will be rejected.
 - 2. Deliver concrete coating materials to the project site in sealed containers bearing the manufacturer's original labels with the brand, color, and type clearly marked on each container.
- C. Apply the concrete coating system to the concrete surfaces shown on the plans or as specified.

3.2 CONCRETE SURFACE PREPARATION

- A. Finish minor defects to blend with the balance of the textured surfaces.
 - 1. Repair visible vertical or horizontal seams or conspicuous form marks to the satisfaction of the Engineer.
- B. Cure all new concrete surfaces a minimum of 28 days before being coated.
 - 1. As an alternate to 28 days, cure 14 days if the concrete has a pH level of 10 or lower per ASTM D 4262 and no surface moisture per ASTM D 4263.
 - 2. Cure concrete patches a minimum of seven days before being coated.
 - 3. Meet manufacturer's requirements.
- C. Thoroughly clean the concrete surface to be coated by pressure washing.
 - 1. Use a minimum water pressure of 3000 psi at a flow rate of 3 to 5 gal/min.
 - 2. Use a fan nozzle held perpendicular to the surface at a distance of 12 inches to 24 inches.
 - 3. Prevent overblasting, exposing additional air pockets, disfiguring the surface, or reducing architectural surface textures.
 - 4. Clean the final concrete surface to be free from release agents, grease, dirt, and any other contaminants. Remove curing compounds that deter penetration of the coating system.
 - 5. Rinse thoroughly with potable water if detergents or de-greasers are used in the cleaning process.
- D. Perform pH test per ASTM D 4262 before coating concrete surfaces.
 - 1. If the pH exceeds 9, add acid-etch to the power wash stream to reduce the pH. Rinse acid-etched surfaces with potable water no sooner than one-hour after application of the acid-etch and prior to re-testing the pH level.
 - 2. Repeat process until the pH level does not exceed 9.
- E. Perform chloride test using Chlor*test by Chlor*Rid Company, SCAT test by KTA Tator, or approved equal.
 - 1. Add a salt remover (such as Chlor*Rid) to the power wash stream to reduce the chloride level and retest the surface if the chloride level exceeds 50 ppm.
 - 2. Repeat the process until the chloride level does not exceed 50 ppm.
- F. Use compressed air for final cleaning.
 - 1. Use an air compressor equipped with suitable separators, traps, or filters that remove water, oil, grease, and other substances from the air line.

- G. Comply with the manufacturer's recommendations for surface preparation if they exceed the requirements specified herein.

3.3 APPLICATION OF COATING SYSTEM

- A. Do not apply the coating if the surface is wet due to rain or other precipitation.
 - 1. Allow all wet surfaces a 24-hour period to dry before coating.
- B. Coat only when the outside air temperature will remain between 45 and 90 degrees Fahrenheit for 24 hours.
- C. Coat areas shown on the drawings.
 - 1. Apply a minimum of two coats of the concrete sealer.
- D. Re-clean contaminated surfaces as defined in this Section, article 3.2 before the application of the next coat if surface becomes contaminated between coats.
- E. Stir the concrete sealer thoroughly before and during application.
- F. Apply the first coat of the concrete sealer evenly at an application rate of 1 gal sealer/350 to 400 sq ft working in one direction.
- G. Thoroughly cure the first coat of the concrete sealer a minimum of 12 hours before the second coat of the concrete sealer is applied.
- H. Apply the second coat of the concrete sealer evenly at an application rate of 1 gal sealer/350 to 400 sq ft working in the opposite direction of the first coat.
- I. Apply a coat of the tinted concrete sealer evenly over the affected area using an application rate of 1 gal sealer/350 to 400 sq ft for graffiti removal.
 - 1. Use the same color as the original application.
- J. Reduce pressure to prevent atomizing of product, which causes dry spray when applying the coating by spray application.
 - 1. Use a sprayer tip size 704/FX or equivalent.
 - 2. Spray from multiple angles to ensure that all surface texture impressions are covered.
 - 3. Spray upper areas from raised platforms.
- M. Dilute the concrete sealer with Xylene at a rate of 8 gal/drum or approximately 15 percent when applying the first coat of sealer over smooth dense (steel formed) vertical surfaces.
 - 1. Do not dilute on more porous concrete or when applying the second coat.

- N. Comply with the manufacturer's recommendations for application if they exceed the requirements specified herein.
- O. Protect coated surfaces from damage or detrimental elements during drying and curing.

3.4 FIELD INSPECTION

- A. Inspect surfaces to be coated after the surface is cleaned and after each coating for compliance with manufacturer's recommendations and this specification.
- B. Use rubber rollers or other approved protective devices on scaffold fastenings.

3.5 PROTECTION FROM WORK

- A. Protect all surfaces that are not to be coated, including structures, slopes, and highway appurtenances, from splatter, splashes, and overspray, or when damage during coating and power washing operations could occur.
- B. Protect all citizens and private property from splatter, splashes, and overspray, including but not limited to buildings, pedestrians, and vehicles.
 - 1. Prevent spreading or falling of abrasive materials and debris on the traveled portions of the pavement.
- C. Suspend work if protection is unsatisfactory.
- D. Remove any abrasive material and debris deposited on the structure, pavement, shoulders, or slope protection before reopening work areas to traffic.

3.6 CLEAN UP

- A. Follow the manufacturer's recommendations for cleaning spills and spatters.

3.7 SAFETY PRECAUTIONS

- A. Follow safety precautions per manufacturer's product data sheets and Material Safety Data Sheet.

END OF SECTION

Standards Committee Submittal Sheet

Name of preparer: Paul West

Title/Position of preparer: Wildlife Biologist

Specification/Drawing/Item Title: Wildlife Escape Ramps and Standard Wildlife Escape Ramp Details and High Migratory Wildlife Escape Ramp Details

Specification/Drawing Number: 02827, FG-4A and FG-4B

Enter appropriate priority level:

(See last page for explanation)

3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

The name of these drawings is confusing and even misleading. Project managers, design engineers, and consultants have had to ask me where the drawings are located for the Wildlife Escape Ramps, which is a more appropriate and descriptive name for these structures. The current title, "Deer Crossing Details," conjures up visions of wildlife overpasses or underpasses instead of escape ramps. In addition, deer are not the only animals that will use these structures, thus the change to "Wildlife" Escape Ramps.

It is proposed, therefore, that figure FG 4A (Deer Crossing Details or Deer Gate) be changed to "Standard Wildlife Escape Ramp Details" and FG-4B to "High Migratory Wildlife Escape Ramp Details." These changes should clarify the purpose of these structures.

In addition, comments from reviewers suggested some minor structural changes in the drawings. These changes should make for easier interpretation.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

N/A

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

See Review Comments Form

ACEC Comments: (Use as much space as necessary.)

See Review Comments Form

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Construction Engineers

See Review Comments Form

Contractors (Any additional contacts beyond “C” above.)

N/A

Suppliers

N/A

Consultants (as required) (Any additional contacts beyond “C” above.)

N/A

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.)
(This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

See Review Comments Form

Others (as appropriate)

N/A

E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

N/A

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

N/A

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

**Names of the structures will be changed on the Standard Drawings
and the Supplemental Standard Specifications**

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

N/A

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

N/A

3. Life cycle cost.

N/A

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Benefit will be reduction of confusion over the name of the structures vs. their functionality.

H. Safety Impacts?

N/A

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

Currently, project managers and planners are confusing these structures for other kinds of structures, including wildlife overpasses and underpasses. This change would clarify the structures' actual design.

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

Priority 1 Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised.

Priority 2 Upon posting, this impacts projects being advertised.

Priority 3 Upon posting, the approved standard takes effect **four weeks** later for projects being advertised.

Std Dwg/Spec Number	FG-4A, FG-4B, and FG-4C	Sheet 1	of	9
Date:	September 20, 2007	Facilitator:	Paul West	

Review Comments Form

Item No.	Reviewer	Sheet/Section No.	Comment	Review Mtg. Action	Final Action.
1	Robert Westover, R-3 Admin		No comment		
			Response:		
2	Brent Schvaneveldt, R-3 Eng. Mgr.		No comments		
			Response:		
3	Christopher Lizotte, R-1 Env. Mgr.		How much input do we allow DWR? Are they going to like these the way they are so that I won't have Pam K. asking me to change something?		
			Response: The design for the migratory escape ramp came from a game warden in her office. She knows all about it and endorses it.		
4	Christopher Lizotte, R-1 Env. Mgr.		Actual interagency coordination! Dogs and Cats living together! Can I stand the strain.....good job man...		
			Response:		
5	Steve Poulsen, R-2 Systems Planning		Paul, I forwarded your email to Marwan Farah, who replaced me as R.E. in R2.		
			Response:		
6	Fred Jenkins, R-4, Price Construction Mgr.		No comments		
			Response:		
7	Joe Kammerer, R-2 Eng. Mgr.		No comments		
			Response:		
8	Kevin Kilpatrick, R-2 Env. Lead		The changes look fine on my end. I have no additional comment		
			Response:		
9	Mike Miles, R-4 Eng. Mgr.		I have no comments		
			Response:		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet

Review Comments

Std Dwg/Spec Number	FG-4A, FG-4B, and FG-4C	Sheet 2	of	9
Date:	September 20, 2007	Facilitator:	Paul West	

10	Jason Davis, R-2 Deputy Dir.	Who defines this and how is "High Migratory" areas defined?		
		Response: High migratory routes, or areas, are defined by the Utah Division of Wildlife Resources (UDWR). We at UDOT would only consider using the High Migratory Wildlife Escape Ramps after consultation with UDWR wildlife biologists and we would place them in locations where these biologists say they would be of benefit.		

11	Jason Davis, R-2 Deputy Dir.	Thanks		
		Response:		

12	Randall Taylor, R-4 Environmental Engineer	The name change seems good to me. I'm glad you're moving forward with these details.		
		Response:		

13	Scott Nussbaum, R-1 Materials Engineer	References to "horizontal and longitudinal lagging" in notes on 4B and 4C are not clear to me. Should the reference match the spec under 2.1, and should these be called "timber planks"? I know this comment is related to the original specification, and not to your changes. 02827 1.4 B: Check spelling on "earthen" 02827 2.1 A: I am concerned about the simplistic reference to MSE blocks. There is no reference to materials or installation requirements. Which posts can be deleted if an mse wall is built? Since MSE walls depend on compaction and a leveling pad, are there any requirements? I suggest we eliminate this option unless we want to actually design an MSE wall solution for this application. 02827 2.1 A: For clarity, since 6055 indicates treated lumber as required, I recommend the following change: " . . . of grading WWPA No. 2 that is <u>treated</u> and free from decay, splits, multiple cracks . . . "		
		Response: Term "lagging" changed to "backing" as suggested The word "planks" added after "timber" as suggested Spelling checked and corrected MSE Blocks eliminated The word "treated" added as suggested.		

14	Scott Andrus, R-3 Eng. Mgr.	I don't have any comments on these.		
		Response:		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet

Review Comments

Std Dwg/Spec Number	FG-4A, FG-4B, and FG-4C	Sheet 3	of	9
Date:	September 20, 2007	Facilitator:	Paul West	

15	Barry Axelrod, Standards Tech. Writer		Our review is done after your copies are submitted to us for the agenda and usually is related to formatting, but from what we have discussed over the last few months I don't see a problem from our standpoint.		
			Response:		

16	Lyndon Friant, R-4 Eng. Mgr.		Under the new standard spec section 1.4 part b. should read earthen not eathen. Looks good as far as I can see. I assume depending on which ramp is to be used, it will be spelled out in the bid item.		
			Response: Yes, the type of ramp and location should be decided on during the concept or design phases, so it can be entered into the bid package. I don't anticipate using many of these bigger escape ramps, just in areas of high wildlife migration.		
			Thanks too for the catch in the spelling. I'll get that corrected.		

17	Daniel Young, R2 - Project Manager		I have no comments...		
			Response:		

18	Lloyd Neeley, UDOT Maint. Eng. Mgr.		I have no comments.		
			Response:		

19	Rob Wight, R-2 Eng. Mgr.		The only comments I have from the maintenance side is that perhaps grade-separated crossings should be explored before the ramps. I realize that these are more expensive, but we have noticed deer getting trapping using at grade crossings.		
			Response: You're right Rob. However, I'm not advocating at-grade crossings at all. Even with grade-separated crossings, including wildlife-proof fencing, we've found we still need escape ramps for the few animals that get caught in the ROW. In high migratory areas, the enhanced model would be even more important as more deer, elk, and moose can get trapped. That's why the "enhanced" design was approved some time ago. This round of approvals is just to change the name of the structure so people will know what it's for. The old name of "wildlife crossover structure," was misleading.		

20	Richard Crosland, R-3 Env. Mgr.		I don't have any comments other than would screws be better than the galvanized nails?		
			Response: 4" wood screws added as suggested.		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet

Review Comments

Std Dwg/Spec Number	FG-4A, FG-4B, and FG-4C	Sheet 4	of	9
Date:	September 20, 2007	Facilitator:	Paul West	

21	Sarhan, Anthony, FHWA		What is the nature of the modifications being made to the drawings? The last sentence of Section A makes it sound like there are modifications being made to the drawings themselves.		
			Response: The only actual changes to the drawings were some modifications to incorporate the new standard wildlife proof fencing, and a few editorial changes that include clarified names, etc. Nothing major.		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet

Review Comments

Std Dwg/Spec Number	FG-4A, FG-4B, and FG-4C	Sheet 5	of	9
Date:	September 20, 2007	Facilitator:	Paul West	

22	Rebecka Stromness, UDOT Environmental	<p>02827 Spec: Definitions- a) Standard Wildlife Escape Ramp - Suggest removing "as shown in the on the FG Series Standard Drawings, "Wildlife Escape Ramps". b) High Migratory Wildlife Escape Ramps- Suggest removing "as shown in the FG Series Stand Drawings, "Wildlife Escape Ramps".</p> <p>Installation a) Be consistent with whether or not you are going to capitalize "Wildlife Escape" b) Step D. It says to place end panels on both sides of the wildlife escape ramp openings. It seems like you would install the posts for the end panels at the same time as Step C. I guess I don't understand why this is a separate step. c) Step D. (See also FG 4B - Drift Fence Detail). It says to Place brace panels on each end of the 24 feet 9 inch drift fence. The drawing shows the entire drift fence as 24'9"(part of that length is the brace panel). So is the brace panel in addition to the 24'9" drift fence? d) At what point do you install the wire mesh fencing? e) Step H. It says to Remove the upper section of fence near the wildlife escape ramp. It may be more clearer if you state it as removing wire mesh fencing to create opening.</p> <p>FG 4A a) I don't think this drawing is needed. Both are shown on FG 4B and FG 4C respectively.</p> <p>FG 4B a) Isometric View - Suggest showing the horizontal timbers in the Drift Fence. b) Isometric View - Note about the High Migratory Wildlife Escape Ramp does not use the drift fence down the center of the ramp. Suggest removing from FG 4B and putting on FG 4C. c) Isometric View - Suggest adding some labels for Drift Fence, End Panel, Brace Panel. d) Standard Wildlife Escape Ramp Plan View - Add a label for the Highway e) Standard Wildlife Escape Ramp Plan View - There is a call out referring you to "See Std Dwg FG 4A for deer ramp details. Well 4G doesn't have any more information, it is exactly the same. Delete this call out. f) Drift Fence Detail - Do you need some vertical dimensions? g) Standard Wildlife Escape Ramp Detail - The note says to use timber, yet the spec says you can use MSE blocks in place of timber. Clarify what material can be used.</p> <p>FG 4C a) Standard Wildlife Escape Ramp Detail - The note says to use timber, yet the spec says you can use MSE blocks in place of timber. Be consistent. b) High Migratory Wildlife Escape Ramp Plan View - There are two call out, both refer you to "See Escape Ramp Details". Suggest changing to "See High Migratory Wildlife Escape Ramp Detail".</p>		
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Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet

Review Comments

Std Dwg/Spec Number	FG-4A, FG-4B, and FG-4C	Sheet 6	of	9
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			<p>Response:</p> <p>02827 Spec: Definitions- Wording deleted as suggested</p> <p>Installation a) Capitalization fixed b) Wording changed to indicate posts are all installed at the same time c) Step D combined with Step C d) V-mesh fabric installation added to INSTALLATION steps e) Wording changed to "Remove wire mesh fence fabric to create opening in Wildlife Escape Ramp as shown ..."</p> <p>FG 4A a) Figure 4A eliminated</p> <p>FG 4B a) Done b) Done c) That would make the drawing too busy. There is no room. d) Done e) Done f) Vertical dimensions added g) MSE blocks eliminated</p> <p>FG 4C a) MSE blocks eliminated b) Wording changed as suggested</p>		
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23	Robert Dowell, R-4 Dist. Eng.		no comments		
			Response:		

24	Ed Woolford, FHWA		FHWA does not have any comments at this time.		
			Response:		

25	Sarhan, Anthony, FHWA		I have no comment at this time.		
			Response:		

26	Tim Biel, Eng Mgr. Materials		I have no comments.		
			Response:		

27	Mont Wilson, AGC		<p>Responded via phone:</p> <p>1) Concerned about how the cost of these ramps will be figured in a bid package for contractors.</p> <p>2) Who decides where these ramps are to be placed?</p>		
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Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet

Review Comments

Std Dwg/Spec Number	FG-4A, FG-4B, and FG-4C	Sheet 7	of	9
Date:	September 20, 2007	Facilitator:	Paul West	

			Response: 1) Cost of ramps are to be calculated as separate bid items by project managers. 2) UDOT Wildlife Biologist and UDWR Wildlife Biologists will determine the placement.		
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28	Clark Mackay, R-4 Eng. Mgr.		Sheet FG 4C Your drawing shows the deer fence as having wooden posts. I believe the standard is steel posts. Your isometric drawing shows the drift fence only coming out three sections. The dimension given is 100'. I would suggest a break line so as to not imply three sections on both sides.		
			Response: Drawing changed to show T-posts after brace panels Updated drawing will show break lines		

29	Brandon Weston, R-2 Environmental Mgr.		No comment.		
			Response:		

30	Tyler Yorgason, Civil Science		I have not received any comments from ACEC members yet. If I receive any by the Oct 3 date you had identified, I will forward them to you. I did have one or two comments I'll mention here: 1. The two plan views on FG 4A look like they are duplicated exactly on FG 4B and FG 4C. Can the first drawing be deleted and just have one drawing for a Standard Wildlife Escape Ramp and one for a High Migratory Wildlife Escape Ramp? 2. What are the MSE blocks mentioned in 2.1.A? Does another spec need to be referenced or additional detail shown on the drawings?		
			Response: Drawing 4A eliminated MSE blocks eliminated		

31	Richard Clarke, Maintenance Mgr.		You need to run you spell checker but it looks good to me.		
			Response: Spelling corrected		

32	Bill Lawrence, R-2 Preconstruction Engineer		No comments		
			Response:		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet

Review Comments

Std Dwg/Spec Number	FG-4A, FG-4B, and FG-4C	Sheet 8	of	9
Date:	September 20, 2007	Facilitator:	Paul West	

33	Rick Torgerson, R-4, Program Mgr.		I have no comment. The name change make sense.		
			Response:		

34	Boyd Wheeler, Structures Eng. Mgr.		<p>1. Please verify the clear zone dimension on the drawings. Traffic and safety has defined distances to similar obstructions as 1.2 times clear zone.</p> <p>2. I recommend removing the reference to MSE blocks in section 2.1 of the spec. If it is left in place, please add connection details to the posts or add additional details showing requirements of the ramps with MSE blocks including reinforcing for the 5 foot wall.</p> <p>3. Rework 1.4 B. eathen should be earthen. It appears that the two opposing ramps are perpendicular to the right of way fence and the one along the fence is parallel.</p> <p>4. If the MSE option is used section 3 needs to be adjusted to account for its use.</p>		
			<p>Response:</p> <p>1. Note added to indicate end of wing fence should end at 1.2 times clear zone</p> <p>2. MSE blocks eliminated</p> <p>3. Wording changed and typo corrected</p> <p>4. MSE blocks eliminated</p>		

35	Nathan Lee, R-1 Project Mgr.		No comment		
			Response:		

36	Clark Mackay, R-4 Eng. Mgr.		<p>One thought I had last night was whether the corner brace post system to tie into your deer escape ramps would need to be wood. It may be difficult to tie in a metal corner brace post system to the wood. I do not know who to suggest to ask but it might be a constructability issue that needs to be considered.</p>		
			<p>Response:</p> <p>Corner braces are wood. New drawing shows tension wires in brace panels, and T-posts for rest of fence.</p>		

37	Nick Peterson, R-1 Field Eng.		No comments		
			Response:		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

Standard Drawing/Specification Review Sheet		Review Comments		
Std Dwg/Spec Number	FG-4A, FG-4B, and FG-4C	Sheet 9	of	9
Date:	September 20, 2007	Facilitator:	Paul West	

38	Rukhsana Lindsey, Dir. Research		I think that may clear up the confusion. What are they called nationally?		
			Response: They go by a couple of different names, Wildlife Escape Ramps, or Wildlife Jump Outs. I happen to prefer the former. It is more descriptive and professional sounding.		

39					
			Response:		

Action Code	A	B	C	D
	Submitter will Comply	Submitter to Evaluate	Delete Comment	Others to Evaluate

SECTION 02827

WILDLIFE ESCAPE RAMPS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Materials and procedures for constructing Wildlife Escape Ramps.

1.2 RELATED SECTIONS

- A. Section 02056: Common Fill
- B. Section 02231: Site Clearing and Grubbing
- C. Section 02822: Right-of-Way Fence and Gate
- D. Section 02911: Mulch
- E. Section 02912: Topsoil
- F. Section 02922: Seed, Turf Seed, and Turf Sod Section
- G. Section 06055: Timber and Timber Treatment

1.3 REFERENCES

- A. ASTM A 116: - Zinc Coated (Galvanized) Steel V-mesh Fence Fabric

1.4 DEFINITIONS

- A. Standard Wildlife Escape Ramp: An earthen ramp, perpendicular to the right-of-way fence, to allow wild animals to escape from the right-of-way, as shown on FG-4 Series Standard Drawings, ~~as shown in the on the FG Series Standard Drawings, "Wildlife Escape Ramps"~~.
- B. High Migratory Wildlife Escape Ramps: Three earthen ramps, two opposite ~~opposing~~ each other and perpendicular parallel to the right-of-way fence, plus one between them, perpendicular parallel to the right-of-way fence, ~~as shown in the~~

FG Series Standard Drawings, “Wildlife Escape Ramps”, creating a three-sided corral for animals to jump into to escape from the right-of-way, as shown on FG-4 Series Standard Drawings.

PART 2 PRODUCTS

2.1 TIMBER PLANKS

- A. Sound Lodgepole pine, Ponderosa pine, Engelmann spruce, Douglas fir, hem-fir or Western Larch of grading WPA No. 2 that is treated and free from decay, splits, multiple cracks or any other defect, and structurally suitable as per Section 06055. ~~(MSE blocks can be used instead of treated timbers).~~

2.2 ROUND TIMBER

- A. Use timber meeting Section 02822.

2.3 WIRE MESH FENCING

- A. As specified in ASTM A 116.
- B. Two 50-inch sections of galvanized V-mesh fencing material with doubled and twisted 12½ gauge line wires with 14 gauge V-wires, as shown in the Deer Barrier Right-of-Way Fence, Type G, on the FG Series Standard Drawings.
- C. Class I zinc coating.

2.4 NAILS/SCREWS

- A. Use 16d galvanized nails, or 4” galvanized wood screws.

2.5 BORROW

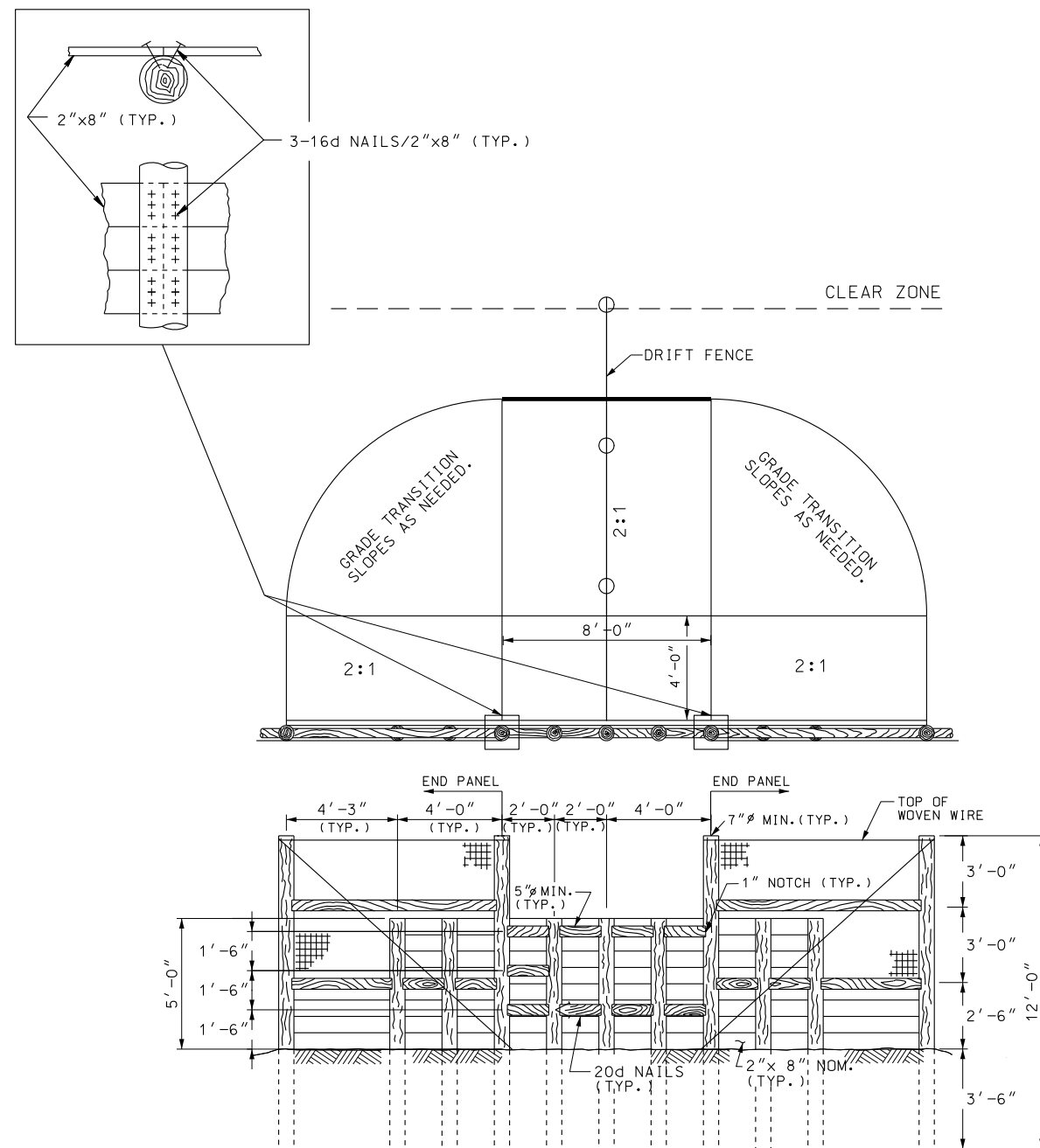
- A. Borrow. Refer to Section 02056.

PART 3 EXECUTION

3.1 INSTALLATION

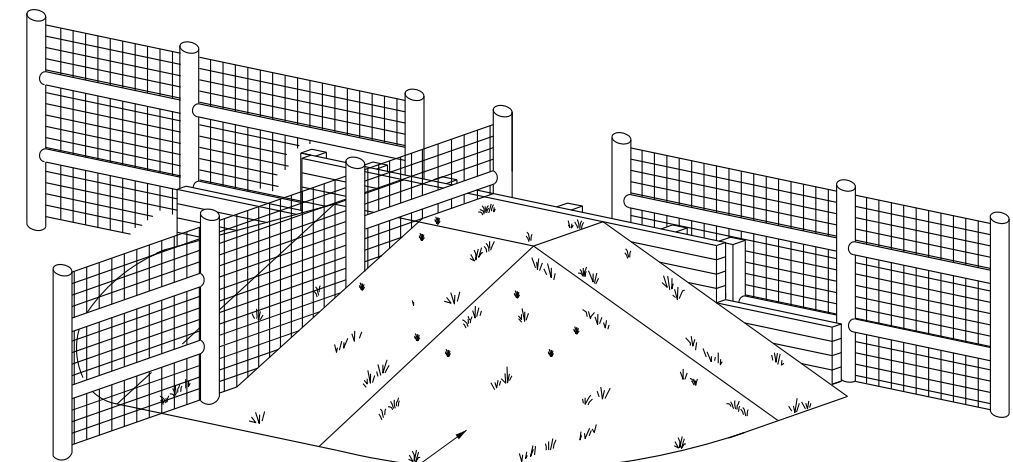
- A. Locate Wwildlife Eescape Rramps by type as identified in the plans.
- B. Within the footprint of the Wwildlife Eescape Rramp clear and grub as per Section 02231 and Strip and Stockpile 4 inches of topsoil.
- C. Install vertical posts for the escape ramps, end panels, and brace panels as shown in the Wwildlife Eescape Ramp Detail on FG Series Standard Drawings.
- ~~D. Place Eend panels are to be placed on both sides of the Wwildlife Eescape Rramp openings. Place brace panels on each end of the 24 foot 9 inch drift fence. Refer to FG Series Standard Drawings.~~
- ~~D~~E. Securely fasten ~~nail~~-ends of the nominal 2 inch x 8 inch planks to the posts with 16d nails or 4" wood screws as shown in the Wwildlife Eescape Ramp Detail per FG Series Standard Drawings.
- ~~E~~. Install V-mesh fencing fabric as shown on FG ~~1~~ and FG ~~2~~ sSeries Standard dDrawings for ROW Fence and Gates – Deer Barrier. Remove V-mesh fencing material above ramps to create opening as shown in FG Series Standard Drawings.
- ~~F~~F. Place borrow material for ramp as shown on the isometric view per FG Series Standard Drawings.
- ~~G~~G. Upon completion of borrow placement, cover the Wwildlife Eescape Rramp with topsoil, seed and mulch as per Sections 02912, 02922 and 02911 respectively.
- ~~H. Remove upper section of fence near wildlife escape ramp as shown in FG Series Standard Drawings.~~

END OF SECTION



STANDARD WILDLIFE ESCAPE RAMP DETAIL

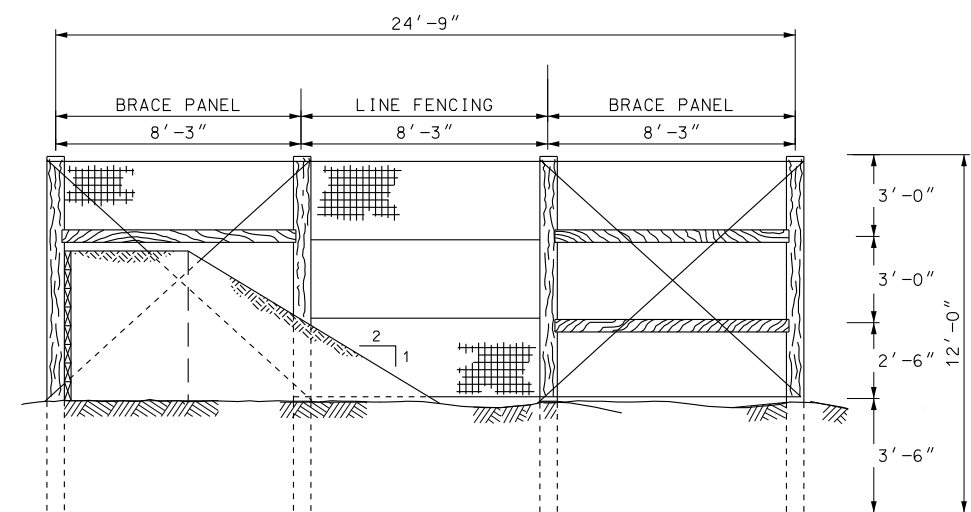
NOTE: USE 2" x 8" TIMBER PLANKS FOR ALL HORIZONTAL
AND LONGITUDINAL BACKING.



TOPSOIL (4" DEEP)
BROADCAST SEED
WOOD FIBER MULCH

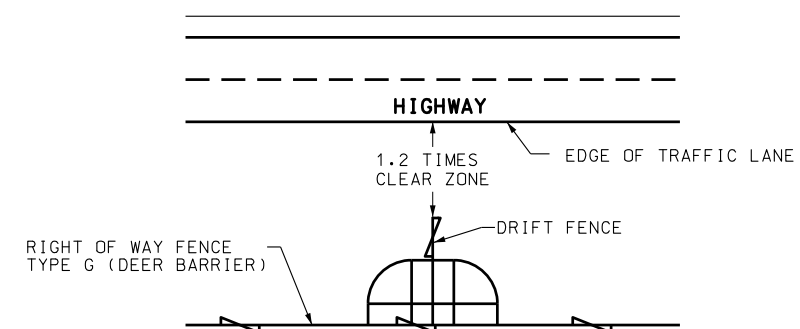
ISOMETRIC VIEW

NOTE:
SEE LINE BRACE DETAILS AS SHOWN ON
STD DWG FG 1A, FG 1B, FG 2A, AND FG 2B.



DRIFT FENCE DETAIL

ALL FENCES TYPE (DEER BARRIER)



STANDARD WILDLIFE
ESCAPE RAMP
PLAN VIEW

NOTE: DESIGN MAY BE MODIFIED AS
GROUND CONDITIONS DICTATE.

[illegible]

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

「陳水扁」

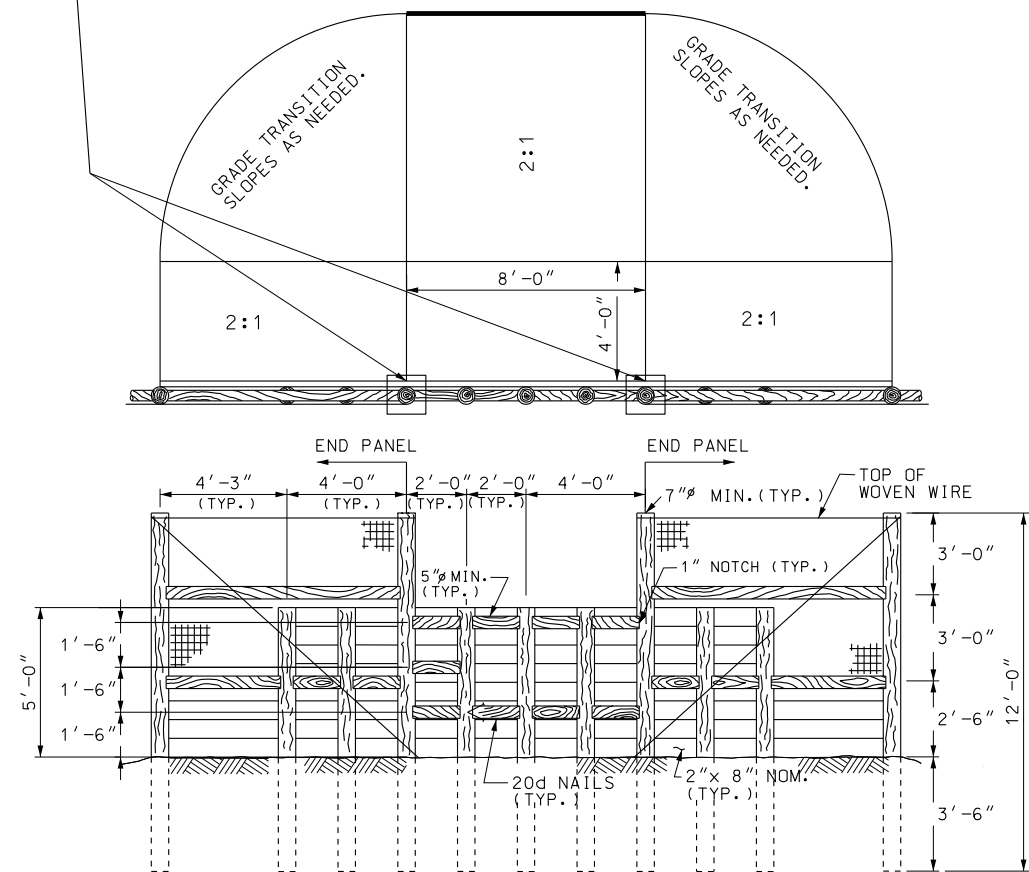
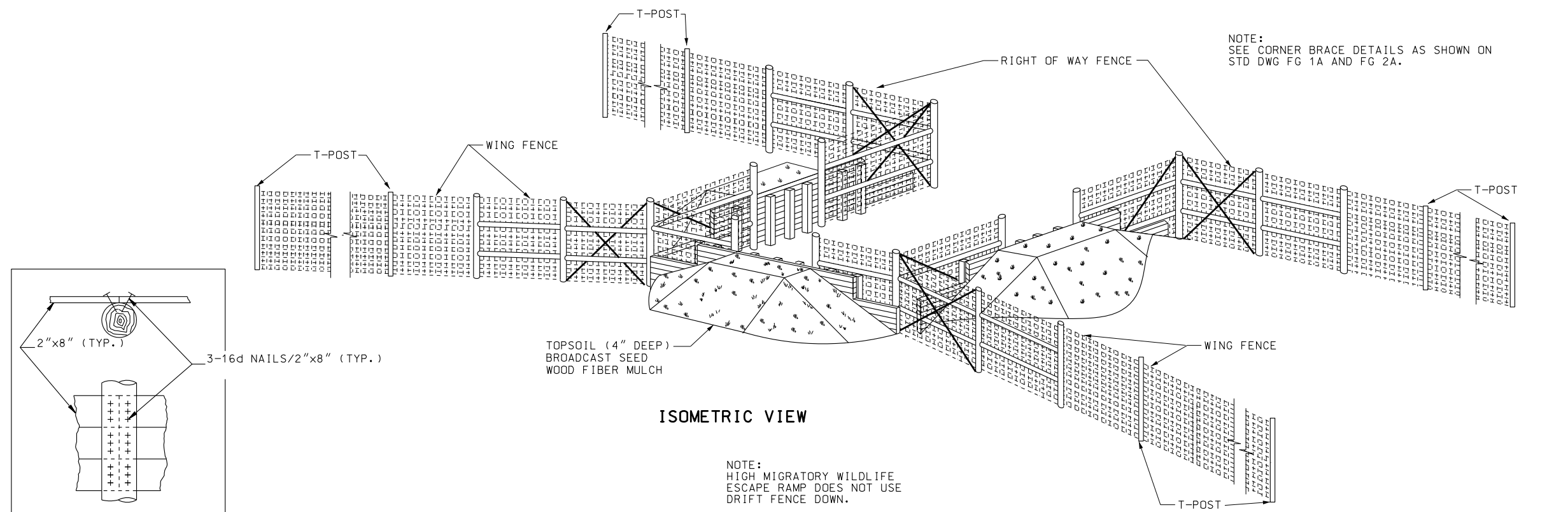
CHAIRMAN STANDARDS COMMITTEE
APPROVED

DEPUTY DIRECTOR

STANDARD DRAWING TITLE

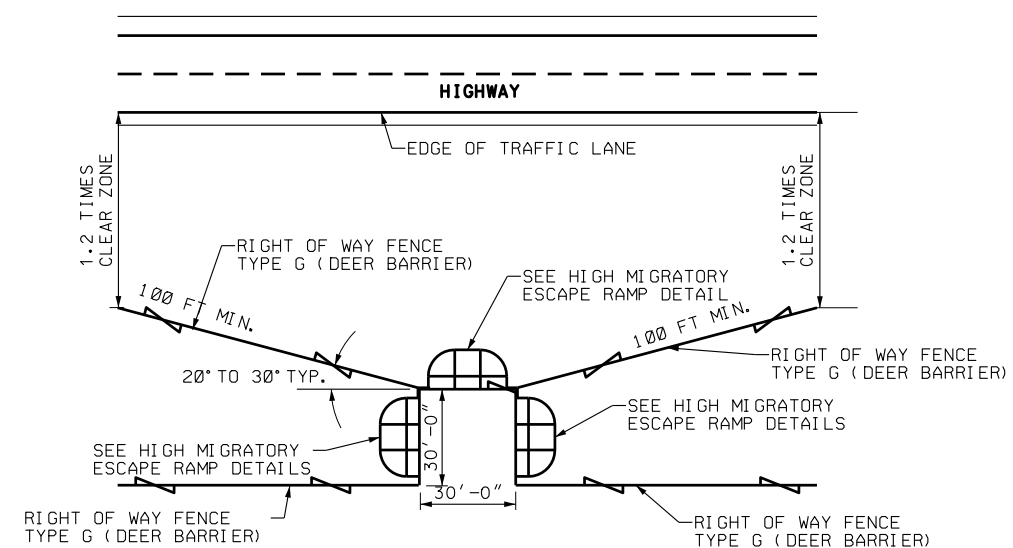
STANDARD WILDLIFE ESCAPE RAMP DETAILS

STD DWG
FG 4A



HIGH MIGRATORY WILDLIFE ESCAPE RAMP DETAIL

NOTE: USE 2" x 8" TIMBER PLANKS FOR ALL HORIZONTAL
AND LONGITUDINAL BACKING.



HIGH MIGRATORY WILDLIFE
ESCAPE RAMP PLAN VIEW

NOTE: DESIGN MAY BE MODIFIED AS
GROUND CONDITIONS DICTATE.

[illegible]

Standards Committee Submittal Sheet

Name of preparer: Terry Johnson

Title/Position of preparer: Senior Landscape Architect

Specification/Drawing/Item Title: Vegetation Establishment Period

Specification/Drawing Number: 02936

Enter appropriate priority level:

(See last page for explanation)

3

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

After much consideration, we are proposing to remove the Vegetation Establishment Period Standard Specification (02936) and instead use a boiler plate special provision that can be modified and used where necessary. Please provide me your comments. Below are some of the reasons for this recommendation:

- 1) Vegetation establishment periods typically vary from project to project depending on the type of plants being installed, where they are being installed, and who will ultimately be responsible for maintenance. This time period can vary from a month to a year or more and therefore the standard specification has to be modified more often than not.
- 2) There has been much confusion by contractors and UDOT inspectors wondering if this specification applies when no vegetation establishment period pay item is identified on the project. By eliminating the standard spec and using a special provision, this will eliminate the confusion.
- 3) Projects that are under agreement to have the landscaping maintained by a municipality should not have an vegetation establishment period. The municipality should take over maintenance following the final inspection. Too many times, long establishment periods are set up on these types of projects which places responsibility on UDOT for overseeing the site inspections, keeping the project open and satisfying all of the city demands after the establishment period is complete.

- 4) Vegetation establishment period specifications should be specifically adapted to landscaping projects. To establish plants, some projects have pressurized irrigation systems installed, some have gravity water distribution systems, and others are hand-watered. The establishment period specification should be developed to reflect these different irrigation practices with specific requirements.
- 5) Different types of vegetation (containerized, pole plantings, tubelings, bareroot, and sod) are being installed on UDOT projects. Each have specific establishment requirements that should be spelled out in a special provision.
- 6) The vegetation establishment period standard specification seldom gets modified, when it should be modified on nearly every project involving landscaping.

By using a special provision adapted specifically for the project it will force designers to put in place only necessary requirements

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

N/A

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

No comments received

ACEC Comments: (Use as much space as necessary.)

No comments received

Tyler Yorgason added: That seems like a reasonable way to deal with the issues. Generally speaking, it is an approach that will require increased coordination with the region landscape people, but that is probably a good thing overall.

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Construction Engineers

No comments received

Contractors (Any additional contacts beyond “C” above.)

I have talked with several landscape contractors (RBI, Grass Masters, Kelly Ellis, and Grass Plus) doing work on UDOT projects they feel this approach would be much better. It was their initial comments regarding the spec and the confusion it was causing that prompted us to make the change in the first place.

Suppliers

N/A

Consultants (as required) (Any additional contacts beyond “C” above.)

N/A

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

Region Landscape Architects

I have talked with all the region landscape architects and they are in agreement that this is the way we should be going.

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

N/A

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

N/A

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

N/A

F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

N/A

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

N/A

3. Life cycle cost.

N/A

G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.) (Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

N/A

H. Safety Impacts?

N/A

I. History? Address issues relating to the current usage of the item and past reviews, approvals, and/or disapprovals.

N/A

Priority Explanation

Enter the appropriate priority in the box on the first page of the document.

- | | |
|------------|---|
| Priority 1 | Upon posting, this impacts all projects in construction and design with a Change Order, Addenda, and immediate change to projects being advertised. |
| Priority 2 | Upon posting, this impacts projects being advertised. |
| Priority 3 | Upon posting, the approved standard takes effect four weeks later for projects being advertised. |

Standards Committee Submittal Sheet

Name of preparer: Barry Axelrod and Robert Miles

Title/Position of preparer: _____

Specification/Drawing/Item Title: N/A

Specification/Drawing Number: N/A

Enter appropriate priority level: 4-
(See last page for explanation) **2008**

Sheet not required on editorial or minor changes to standards. Check with Standards Section.

NOTES:

1. All Submittal Sheets must be completed and sent to the Standards and Specifications Section by the Standards Committee suspense date as shown on the Web.
(<http://www.udot.utah.gov/index.php/m=c/tid=303>)
2. The Preparer of the Submittal Sheet or the Standards Committee member (or authorized substitute) responsible for the submittal must be present at the Standards Committee meeting and capable of discussing and answering all questions related to the submittal. The item will be postponed to a later meeting if one of these people is not present.
3. Notify the Standards and Specifications Section immediately of any changes that impact the presentation to include absence of sponsor or delay in presentation.

Complete the following: (Use additional pages as needed.)

- A. Why? Detail the reason for changing the Standard (Specification or Drawing), what has initiated a new Standard, or what has caused a new or changed item of interest.

Several specification changes have been reviewed and approved that are more than editorial in nature but not substantial enough for full Standards Committee approval. This method was approved by the Standards Committee during the April 2007 meeting to alleviate a possible backlog of changes in preparation for the 2008 Standards issue.

- B. How is Measurement and Payment handled? Existing (from the measurement and payment document), modified, or new measurement and payment to be included with all Standard Specifications or Supplemental Specifications.

None expected at this time, but could be possible. This still fits within the scope of this sub-group.

- C. Stakeholder Notification for AGC and ACEC:

By email provide the AGC and ACEC Standards Committee member a copy of all pertinent information relating to the specification or drawing. Detail all responses below. Indicate if no comments were received.

Note: There is a two-week response time set for this item.

Refer to the Standards Committee Web site, Members page at <http://www.udot.utah.gov/index.php/m=c/tid=659> for the respective e-mail addresses.

AGC Comments: (Use as much space as necessary.)

N/A

ACEC Comments: (Use as much space as necessary.)

N/A

- D. Stakeholders? From the list provided, document the stakeholders contacted, detailing: the company, name of contact, how contacted (by phone, email, hard copy, or in person), concerns, and comments of the change. Stakeholders:

Note: There is a two-week response time set for this item. Allow Stakeholders two weeks to process and respond to coordination requests. All areas should try to complete review and comment as soon as possible but within two weeks.

In-house (for example, preconstruction, materials, construction, safety, design, maintenance) (Include all applicable in-house areas even if not listed above.)

Sub-group consists of Robert Miles, Barry Axelrod, John Butterfield, and an FHWA representative. Others attend as appropriate to present their material.

Construction Engineers

N/A

Contractors (Any additional contacts beyond "C" above.)

N/A

Suppliers

N/A

Consultants (as required) (Any additional contacts beyond "C" above.)

N/A

FHWA (To be accomplished as part of the two-week process before submitting to the Standards and Specifications Section for inclusion on the Standards Committee agenda.) (This is in addition to the requirements of UDOT Policy 08A5-1, procedure 08A5-1.3.)

N/A

Others (as appropriate)

As needed.

- E. Other impacted areas, systems, or personnel. (Consider all impacts and possible changes to these areas during the preparation process. Coordinate with all appropriate areas for the respective item. List all impacts and action taken.)

1. Minimum Sampling and Testing Guide (MS&T Guide)

N/A

2. Business Systems (Electronic Bid System, Project Development Business System, Electronic Program Management, Computer-Aided Drafting and Design, etc.)

N/A

3. Implementation Plan (Provide detailed instructions on how the subject item will be implemented to include notification of all interested parties and training requirements.)

Standard publishing procedures.

- F. Costs? (Estimates are acceptable.)

1. Additional costs to average bid item price.

Unknown. May be applicable on a case-by-case basis.

2. Operational (For example, maintenance, materials, equipment, labor, administrative, programming).

Unknown. May be applicable on a case-by-case basis.

3. Life cycle cost.

Unknown. May be applicable on a case-by-case basis.

- G. Benefits? (Provide details that can be used to complete a Cost – Benefit Analysis.)
(Estimates are acceptable.) (If no costs, what is the benefit of making this change?)

Improve wording and flow of specifications. Better standardization of actions.

- H. Safety Impacts?

None anticipated.

- I. History? Address issues relating to the current usage of the item and past reviews,
approvals, or disapprovals.

None

Action Item Update for October 25, 2007 Standards Committee Meeting

(As of October 11, 2007, 10:00 a.m.)

Item 1, Supplemental Specification 01554M, Traffic Control: John Leonard is walking this through the Standards Committee for approval of recommended actions. No other information at the time of publication of the minutes package.

Item 2, Standard Drawings BA 4E, W-Beam Guardrail Installations and ST 8, Plowable Pavement Markers: Glenn Schulte is checking into this to see if the drawings are impacted by the deletion of Sections 02762, Plowable Pavement Markers and 02773, Asphalt Concrete Curt. No other information at the time of publication of the minutes package.

Item 3, Supplemental Specification 02735, Micro-Surfacing. On October agenda as a Standard Specification change for 2008.

Item 4, Supplemental Specification 02789, Asphalt Slurry Seal Coat. On October agenda as a Standard Specification change for 2008.

Item 5, Standard Specification 01355, Environmental Protection. On October agenda as a Standard Specification change for 2008.

Item 6, SW Standard Drawings, cracking issue. Boyd said he talked to Materials and a cracking issue was identified. This will require a future drawing change but it is not ready at this time. The drawings as approved at the August meeting will be published as is. Additional information to be provided by Boyd at the October meeting.

End of Agenda Package